The Big Building - Housing and Complex Design Strategies

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Gerhard Richter, ***Abstract Painting 726***, 1990.

«Bigness is the last bastion of architecture - a contraction, a hyper-architecture. The containers of Bigness will be landmarks in a post-architectural landscape - a world scraped of architecture in the Richter's paintings are scraped of paint: inflexible, immutable, definitive, forever there, generated through superhuman effort.» Bigness surrenders the field to after-architecture.»

Rem Koolhaas, Closing paragraph of the Bigness Manifesto,1994.

Source: Rem Koolhaas, Bruce Mau, *S,M,L,XL*, p. 516.

Abstract

Key-words: scale, architecture, urbanism, complexity, collective housing, density, diversity, hybridization, Big Building, functional mix, typological mix, social mix

Large hybrid objects integrating multiple functions and whose scale, over 100'000 m^2, is halfway between the fragment of a city and that of a large-scale building: these are the key features of the complex projects that are triggering new debates on the subject of Design Complexity, usually referred to as Big Buildings. Recurrently bearing the predominance of housing, the paradigms of these mixed architectural forms - « cities within cities » developed either horizontally or vertically – may recall Le Corbusier's *Unités d'Habitation*, or even the American Hybrids, due to the multiple simultaneous conditions they succeed to accommodate within their generic envelopes. In Europe, either as a consequence of the urban densification and the resulting need for restraining the urban sprawl, or driven by political and economical dynamics of speculation and globalization, we are assisting to the echoed emergence of projects of this kind, often located nearby mobility interfaces or in old industrial areas in process of regeneration, normally with privileged connections to the city centres. The development of such projects is hypothetically becoming a trigger for the creation of new ways of producing collective housing, integrated within a more complex system of activities, bearing new strategies of articulation between housing and other programs, new models of public space, new typological experiments on the dwellings or new ways of invigorating social mix. Our intention is to investigate how effective is, then, the planning of collective housing within the massiveness of the Big Building and how can the design of housing inside this specific *milieu* generate new potentials and new knowledge in the architectural domain of Housing.

Résumé

Mots-clés: échelle, architecture, urbanisme, complexité, logement, diversité, densité, hybridation, Big Building, mixité fonctionnelle, mixité typologique, mixité sociale

Grands objets hybrides intégrant des fonctions multiples dont l'échelle, supérieure à 100'000 mètres carrés, est à mi-chemin entre un fragment de ville et celle d'un bâtiment à grande échelle: telles sont les principales caractéristiques des projets complexes – généralement appelés Big Buildings –, qui déclenchent de nouveaux débats relatifs à la complexité architecturale. Etant donné que les programmes de logement y sont souvent prédominants, les paradigmes de ces formes architecturales mixtes – « des villes dans la ville» développées horizontalement ou verticalement – peuvent rappeler les Unités d'habitation de Le Corbusier, ou encore les "hybrides américains", en raison des conditions multiples qu'ils accueillent dans leurs enveloppes génériques. En Europe, en raison de la densification urbaine et des conséquences qui en résultent pour restreindre l'étalement urbain, ou conduit par les dynamiques politiques et économiques de la spéculation et de la globalisation, nous assistons à l'émergence successive de projets de ce genre, souvent situés à proximité d'interfaces de mobilité ou au sein d'anciennes zones industrielles en cours de mutation, avec des liens privilégiés vers le centre ville. Le développement de tels projets devient hypothétiquement un déclencheur pour la création de nouvelles manières de produire des logements collectifs, intégrés au sein d'un système plus complexe d'activités, portant de nouvelles stratégies d'articulation entre le logement et d'autres programmes, de nouvelles formes d'espaces publics, de nouvelles expériences typologiques sur les logements ou encore de nouvelles façons de stimuler la mixité sociale. Notre but est d'étudier dans quelle mesure la planification du logement collectif au sein d'un Big Building massif devient effective et conséquente, et comment la conception de logement à l'intérieur de ce milieu spécifique peut générer de nouveaux potentiels et de nouvelles connaissances dans le domaine architectural du logement.

Research Summary

RESEARCH TITLE The Big Building – Housing and Complex Design Strategies

RESEARCH OBJECT Large hybrid buildings located in strategic points of dense city centres, integrating multiple functions, bearing a scale that is halfway between a city fragment and a large-scale building, and predominantly containing housing.

RESEARCH HYPOTHESES

H1. The Big Building triggers a new form of *Complexity* in architecture, related simultaneously to scale, functional mix, process and design.

H2. The Big Building raises new architectural issues related to the articulation of multiple different programs.

H3. The Big Building generates innovative solutions of collective housing and its inherent conditions, such as density, diversity and mix.

H4. The conception of the Big Building implies the use of tools that belong simultaneously to the domains of architecture and to urbanism.

RESEARCH OBJECTIVES

O1. Understanding the overall idea of Complexity behind the conception of the Big Building.

O2. Understanding the potentials of the Big Building as an innovative multifunctional device; a 'self-contained city' articulated with the city.

O3. Analysing the conditions and potentials of planning Housing within the Big Building.

O4. Understanding Bigness as a potential new discipline, other that architecture or urbanism, and requiring a new set of specific design tools.

METHOD

a) Theoretical Research: State-of-the-Art analyses of the urban and architectural theories on the main subjects of the research: complexity, density, diversity, functional mix and social mix.

b) Historical Research: Analyses of historical models that are precedents of today's Big Buildings and that still nurture very directly today's architectural realizations.

d) Analytical Research: in-depth analyses of the three main case studies; understanding what kind of forces may have determined their conception and identifying the qualities and weaknesses of each one.

e) Design-based Research departing from the case-studies.

STUDY FIELD Global. Understanding the Big Building as part of a global architectural and political trend within dense city centres. Taking benefit from the freshness of the subject and from the opportunity to track part of the building's conception, completion and actual use.

CASE STUDIES

I. *De Rotterdam*, Rotterdam (NL), OMA, (1997-2013), 162'000m^2

II. *Entrepôt Macdonald*, Paris (FR), OMA & FAA+XDGA, (2007-2015), 165'000m^2

III. *The Interlace*, Singapore, (SG), OMA & Ole Scheeren, (2007-2013), 170'000m^2

CONCLUSIONS

1. The architect is not the exclusive entity to define the layout and the architectural design of the building, often being overpowered by the will of the developers.

2. The high complexity of the process may lead to an over-simplification of the design. The relational complexity one would expect to find inside the Big Building is often supplanted by a subdivision of the volume into different functional areas.

3. The Big Building does not necessarily generate innovation in housing; in some cases, it may bear even simplistic models resolved through typical floorplans.

4. Some specific design strategies can be applied to the design of Big Buildings in order to generate interesting interchange between programs, and also to trigger a sense of community life amidst the inhabitants. Working on intermediary design scales may be key for attaining successful models of Housing inside Big Buildings.

Key Terms

ACTORS	A person or entity responsible for undertaking a specific responsibility on the process of conception, financing or management of a project, towards its completion.
BIG BUILDING	Large hybrid objects integrating multiple functions and whose scale - over 100'000 m^2 - is halfway between a city fragment and that of a large-scale building.
COMPLEXITY*	Unlike complication, *complexity* does not correspond to a simple sum of different parts, but rather to the establishment of logical interactions between the different components.
RELATIONAL COMPLEXITY	Transposing to the design of Big Buildings the relational complexity of urban areas, (especially the one of the street as the quintessential public space) as a strategy to trigger the wealth of social interactions.
DENSITY*	Density is the quantity and quality of simultaneous spaces and uses available in a given frame.
FUNCTIONAL MIX	The coexistence and articulation of multiple different functions within a unitary container.
HYBRID BUILDING	A single entity comprised of two or more recognized parts.
HYBRID (AMERICAN)	The American Hybrid is the title that defines a specific type of American Buildings that have been catalogued by Joseph Fenton in 1985.
MIX*	Mix describes a condition of diversity and variable use reflecting a wide variety of programs within a complex structure intended to serve the broad socio-economic needs of the environment.
PROGRAM	Program is the use made of physical space, designated by the architect.
PROCEDURAL COMPLEXITY	The complexity implied in the process of conception of a Big Building, related to the extensive number of actors and the necessary coordination of different tasks and management of different interests within a normally tight schedule.
SCALE	The relative size of a building according to a determinate referential (normally the context in which it is implemented).
TIME-FRAME*	The temporal horizons of the project and the means by which the horizons are set.
VERTICAL STACKING	The vertical pile-up of different programs within a building, not necessarily bearing a correlation between them.

* Term defined by the Complex Design research group at the time of the workshop ELGE - Explorer la Grande Echèlle in September 2014

Project List

Project	Architect	Location	Type	Area (m²)
West 57	BIG	NY 2016	Mixed (90% H)	77'202
Entrepôt Macdonald	OMA / FAA+XDGA	Paris 2007-16	Mixed (50% H)	167'000
Timmerhuis	OMA	Rotterdam 2009-16	Mixed (21% H)	48'480
Market Hall	MVRDV	Rotterdam 2009-14	Mixed (52% H)	77'200
Toni-Areal	EM2N	Zurich 2005-14	Mixed (12% H)	125'000
Bryghusprojektet	OMA	Copenhagen, 2008-14	Mixed (15% H)	27'000
The Interlace	Ole Scheeren	Singapore 2013	Housing	170'000
IJ Dock	Bakers Architecten	Zurich 2013	Mixed	80'000
Pentominium	Aedas	Dubai 2013	Housing	116'200
De Rotterdam	OMA	Rotterdam 1997-2013	Mixed (21%H)	162'000
Elbphilharmonie	HdM	Hamburg 2013	Mixed	120'000
Block/Tower (N/B)	Allan & Segal	NY, 2011-13	Mixed (25% H)	125'730
Shard	Renzo Piano	London 2012	Mixed	130'000
Mahanakhon	OMA	Bangkok 2012	Mixed	150'000
Mixed-Use Block (N/B)	Abalos Sentkiewicz	Nanjing China 2012	Mixed (25% H)	208'410
Sliced Porosity Block	Steven Holl	Chengdu 2007-12	Mixed (20% H)	310'000
Mixed-Use Block (N/B)	Abalos Sentkiewicz	Nanjing China, 2012	Mixed (25% H)	208'410
New Kuwait Sports Club	Office dA	Kuwait 2006-11	Mixed	100'335
Stadskantoor Rotterdam	OMA	Rotterdam 2011	Mixed	48'480
Chicony Plaza	Goettsch Partners	Chengdu 2011	Mixed	110'000
Beekman Tower, 8 Spruce	Gehry	NewYork 2011	Housing	93'000
56 Leonard Street	H&deM	NY 2011	Housing	44'593
Canton Tower	Info Based	Guangzhou 2010	Mixed	114'000
Pinnacle Duxton	ARC Studio	Singapore 2010	Housing	253'957
Marcel Saupin Stadium	FGP	Nantes 2009	Mixed (21,4% H)	(?)
Vanke Centre	Steven Holl	Shenzen 2006-09	Mixed (22% H)	120'445
Red Apple	KCAP	Rotterdam 2009	Mixed	50'000
Urban Forest (N/B)	MAD	Chongqing 2009	Mixed	216'000
Aqua Tower	Studio Gang	Chicago 2009	Mixed	162'600
486 Mina El Hosn	LAN	Beirut 2009	Mixed	125'000

Project	Architect	Location	Type	Area (m²)
Linked Hybrid	Steven Holl	Beijing 2003-09	Mixed (60% H)	221'000
Low2No (N/B)	REX	Helsinki 2009	Mixed (40% H)	35'200
Bahrain WTC	Shaun Killa, Atkins	Manama 2008	Mixed	708'936
Tour du Signal (N/B)	Jean Nouvel	Paris 2008	Mixed (25% H)	140'000
St. Jakob Turm	H&deM	Basel 1998-2008	Mixed (22% H)	30'300
Sky Village (N/B)	MVRDV	Copenhagen 2008	Mixed (10% H)	23'000
Tour de la Chapelle (N/B)	Abalos Sentkiewicz	Paris 2007	Mixed (25%H)	113'000
Strata SE1	BFLS	London 2007	Housing	306'000
Het Strijkijzer	Paul Bontebal	The Hague 2007	Mixed	30'450
Jian Wai Soho	Riken Yamamoto	Beijing 2007	Mixed	504'237
111 First Street (N/B)	OMA	Jersey City 2006	Mixed (33% H)	112'330
The Edge (N/B)	RCR	Dubai, 2006	Mixed (12% H)	343'990
Dubai Renaissance (N/B)	OMA	Dubai, 2006	Mixed (15% H)	462'500
THE MET	WOHA architects	Bangkok 2005	Dwelling	112'834
Museum Plaza (N/B)	REX	Louisville 2005	Mixed (27%H)	141'800
El Mirador	MVRDV	Madrid 2005	Dwelling	25'393
S Project	OMA	Seoul 2004	Mixed	102'000
Namba parks complex	Jerde Partnership	Osaka 2003	Mixed	130'000
Koning Julianaplein (N/B)	OMA	The Hague 2002	Mixed	92'000
Norddeutsche Landesbank	Behnisch	Hannover 2002	Mixed	75'000
122 Leadenhall Street	Richard Rogers	London 2002	Mixed	84'424
Vienna Twin Towers	Fuksas	Vienna 2001	Mixed	100'000
Cenakeltorens	Brouwer	Tilburg NL 1998	Housing	(?)
Umeda sky building	Hara	Osaka 1993	Mixed	(?)
Corviale	Mario Fiorentino	Rome 1972-82	Housing	605'000
Pearl Bank Apartment	Tan Cheng Siong	Singapore 1976	Mixed	(?)
Quartier du Palais	Gérard Grandval	Crétiel, France 1974	Housing	(?)
Walden 7	Ricardo Bofill	Barcelona 1974	Housing	31'140
The Galleria	David Specter	New York 1973-75	Mixed	(?)
Ihme Zentrum	Helmut Klob & P.	Hanover 1972-75	Mixed	285'000
Nakagin Capsule Tower	Kisho Kurokawa	Tokyo 1972	Hotel	3'091

Project	Architect	Location	Type	Area (m^2)
Trellick Tower	Erno Goldfinger	London 1972	Housing	(?)
John Hancock Center	SOM	Chicago 1965-70	Mixed	280'000
Torres Blancas	Sáenz de Oiza	Madrid 1969	Mixed	(?)
Lake Point Tower	H& Schipporeit	Chicago 1968	Mixed	117'000
Gallatarese Complex	Aymonino & Rossi	Milan 1967-74	Housing	(?)
Brunswick Centre	Patrick Hodgkinson	London 1967-72	Mixed	15'794
Habitat '67	Moshe Safdie	Quebec 1967	Housing	22'160
Robin Hood Gardens	A&P Smithson	London 1969-72	Housing	191'510
Marina City	Bertrand Goldberg	Chicago 1959-64	Mixed (housing)	225'527
Park Hill	Lynn, Smith &W.	Sheffield 1959-61	Housing	74'800
Barbican Complex	Chamberlin P & Bon	London 1955-83	Mixed (housing)	140'000
Torre Velasca	Studio BBPR	Milano 1954-58	Mixed	26'000
Unité d'Habitation	Le Corbusier	Marseille, 1946-52	Mixed (housing)	35'872

H Housing

(N/B) Not Built

Main Case Studies

Secondary Case Studies

Reference Project

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Introduction

1. Research Resume

The problems triggered by the massive territorial urbanization - aside with today's economical and social challenges - imply, according to the principles of sustainable planning, the conception of urban/architectural strategies that become increasingly complex, often merging architectural and urban subjects. Amid the strategies to be applied on the control of the territorial footprint – although often also driven by speculative motors - is the one that envisions the inclusion of varied programs - equipments, housing, mobility, services, activities, - within compact volumes of exceptionally large sizes, implemented in densified urban contexts. The conception of these large and mixed projects may be the premise for a new geography and typology of architectural/urban devices, marked by functional diversity, spatial articulation and new symbolic values. Gradually, pure forms and uses get distorted as the concentration of many social activities within an architectural form distends and distorts a pure building type, ultimately resulting on outsized hybrid objects containing most of the functions one could find in a city. These are called *Big Buildings*.

The name derives from Rem Koolhaas's manifesto "Bigness or the problem of Large", published in *Architectural Design* in 1994, implicitly proclaiming *Bigness* as a new discipline – a new domain, halfway between architecture and urbanism, facing its own particular challenges. Koolhaas claims that "*past a certain point, sheer size surpasses what is normally possible to be contained within classical principles of organization, altering the nature of architecture, its challenges and aspirations*". Indeed, multiple examples show that, from a critical size, the energetic, financial, construction and program issues increase dramatically. In that sense, building such massive built schemes - in view of their size, density, multi-functionality and the multiplicity of involved actors - represents an extremely complex challenge. This complexity is triggered by three fundamental conditions: a) the functional mixed – planning aside various different programs inside an architectural object; b) the size issue and the resultant ambiguity of the architectural object - a hybrid model between architecture and urbanism; c) the procedural complexity that derived from the multiplicity of involved parties. Yet, despite the undeniable complexity of the process behind the conception of today's Big Buildings, the outcomes of the design and the articulation strategies are often simplistic and repetitive.

In that sense, it is imperative to understand what kind of design strategies may succeed at resolving the fundamental complexity of the Big Building – articulating different functions and users within a hyper-dense envelope - and, more fundamentally, to provide good quality solutions for the integration of housing within such enormous buildings. Whereas in the twentieth century, in schemes like Le Corbusier's *Unité d'Habitation*, the mix of uses and types within a large scale building was a direct result of a specific architectural intention, in today's Big Building, such features, along with morphological transformations in shape and unexpected symbolic values, are most of the times a result of the complexity of the overall process. Thus, architects assume increasingly the role of general coordinators and decreasingly the role of authors or thinkers. In this matter, the humanistic and *desired complexity* that has been proclaimed in multiple studies and projects of Alison and Peter Smithson and the Team X in the 1950s and 1960s

- opposing the segregationist principles of the *Charte d'Athènes* - may provide us with thoughts that are a lot more nourishing and significant to the design of Big Buildings than the ones presented by Koolhaas, namely the revival of key elements of the city and the restoration of the relational complexity of the traditional urban environments. Furthermore, Team X's approach is focused primarily on housing, transposing to the design of residential buildings (which tended to follow an orthogonal hygienist logic at the time) the relational complexity of urban areas, especially the one of *the street* as the quintessential public space. How to ensure, then, the quality of each dwelling within such enormous frame? How to provide an interesting variety of dwelling typologies (for different individuals, social types and family types)? How to ensure the effectiveness of the articulation between different inhabitants, uses and users, public spaces and the city?

Through the analysis of a series of case studies, belonging to different epochs and contexts, we tackle the multiple design strategies that have been applied to their formulation, willing to extract valuable knowledge from these paradigms. Then, in a manner of semi-provocation, we will focus on three just-built Big Buildings with Rem Koolhaas's signature, each bearing a specific design approach; we will analyze them and test them by means of design experiments and strategies.

Our ultimate aim is to extract a series of design guidelines that will hopefully help and guide the design of interesting solutions of Big Buildings containing housing, opposing the trend of repetitive, standardized and speculative schemes that can be observed in many recent examples of Big Buildings.

1.2. Hypotheses and Objectives

1.2.1. Research Objectives

O1 **<u>Understanding the overall idea of Complexity behind the conception of the Big Building.</u>**

Our research will depart from the analysis of two fundamental moments of the theory of architecture that tackle the subject of large-scale and complexity. The first moment dates from the 1950-60s and is led by Alison & Peter Smithson and the Team X. It arises with the aim of reintroducing a humanistic form of architectural/ urban complexity, in opposition to the modernist models of large scale and the segregationist principles of the *Charte d 'Athènes*. This 'desirable complexity' is linked to the revival of key elements of the city and the restoration of the implicit relational complexity of the traditional urban fabric - their approach focused on transposing to the design of residential buildings (which tended to follow an orthogonal hygienist logic) the relational complexity of urban areas, especially the one of the street. The second moment, headed by Rem Koolhaas, dates from the 1990s and it refers to the rupture of *scale* – Bigness – as a starting point for *a new type of architecture* – a type that is so complex in its formulation that a single architect can no longer resolve it. Koolhaas focuses more on the process (and its multiple

divergent actors) than on the defiant design challenge, which is that of conceiving and designing complexity within a building of exceptional scale - and still manage to articulate it with its context. Moreover, Koolhaas refers to Bigness as a building model that exists on its own and that hardly relates to the city. Indeed, almost no lines, in his extensive writings allow us to acquaint with the inner complexity of the Big Building – as if the architect had surrendered to the supremacy of the speculative external forces. Does the procedural complexity really imply giving up on a 'desired' form of complexity within density? This ambiguity motivated us to select a set of built examples of Big Buildings (old and new) in order to strengthen our study. In a first moment we seek to understand why these two approaches to scale-and-complexity are so radically different. In a second moment, we launch the hypothesis that a new form of complexity (a desired relational complexity, despite the complexity of the process) can potentially be attained. Can we still aim to develop interesting mixed functional schemes and mixed housing schemes within the Big Building? Shall we take for granted that the Big Building can hardly articulate with any urban context?

O2 Understanding the potentials of the Big Building as an innovative multifunctional device articulated with the city.

The second objective tackles the 'gap' that has been identified in the first, by means of the analysis of both historical and recent case-studies. After understanding the relation between building and context, we seek to understand how the articulation of several disparate programs is planed within the unitary shape of the Big Building, focusing on the observation of how housing relates to the contiguous functions. We will look at the functional organogram of each building to understand the logics of circulation and articulation within it, as if we were staring at the map of a city. We intend to verify how the very different levels of publicity and privacy are resolved, along with the responses that have been given to the challenging security issues. Finally, we will look at housing, the apartment sizes and types, or whether typological or social mix have been at the base of the conception.

O3 Analysing the conditions and potential of planning innovative forms of collective Housing within the Big Building.

In the architectural domain of housing, how does the development of the Big Building, a multi-functional architectural container with a size over 100'000 m^2, potentially generate new knowledge and new practices in the planning of housing? Can we aspire to recreate, within the Big Building's condition of compaction and high density, the wealth of the community living? The house-street relationships, meeting the neighbour, articulating social differences – can these be successfully planned within a large multi-functional container? What kind of housing can be produced within these devices? Can interesting typological schemes, motivators of social mixity, be explored in this particular context? We will again focus on a series of selected case-studies, which might bear interesting solutions of housing within large-scale and mixed use buildings, and try to find answers to these questions.

O4 **Understanding the Big Building as a potential new architectural/ urban model requiring its own particular design tools.**

We will try to understand whether the model of the Big Building implies the use of innovative design methods that merge simultaneous issues and tools of architecture and urbanism. Our theoretical and design analyses, focusing on a thorough selection of examples of Big Buildings, aspire to extract comprehensive observations and strategies, which will hopefully be able to guide and sustain the conception of other Big Buildings, focusing on the most complex of its challenges: articulating the formulation of successful housing schemes within dense, massive and mixed containers.

1.2.2. Research Hypotheses

H1 **As a consequence of its size and its complex conception, the Big Building triggers multiple processes of hybridization and thus motivates a new definition of Complexity.**

The Big Building epitomizes an exception. As a consequence of its scale, the multiplicity of its actors, the economical challenges behind it, and mainly due to the concentration of multiple activities within one built device, the conception of a Big Building ramifies into several different models of hybridization that apply to the ensemble of its related fields.

Economically, new partnerships are created to bring together the necessary volume of capital and diverse simultaneous interests, involving the combination of multiple entities – the PPPs. When it comes to facing the *normative system*, the Big Building imposes the creation of new tools that envision the adaptation of zoning plans, the volumetric property division and the multifunctional land use laws, most of them realized through innovative contractual techniques, instruments used for programming the city vertically.

Although understanding the overall process may be an important exercise, our research will focus primarily on the hybridisation effects that can be observed at an architectural/urban level. Indeed, the Big Building epitomizes a new device of very large dimensions that doesn't fit neither within the standards of the conception of a regular building nor within the traditional processes of the urban planning. It touches simultaneous subjects of architecture and urbanism, yet it represents something new; a new pattern with its own challenges and specificities.

Yet, the most prominent of all hybridization effects may be seen at the Big Building's morphologic features, resulting on formats with no precedents and hard to compare with any architectural archetype. What may start by being a mix of different activities or a simple overlapping of programs, evolves then towards effects of 'strangeness' caused by these new forms.

This hypothesis will be verified along the chapter 1 of this thesis – Complexity.

Additionally, we will raise the hypothesis that the Big Building's large scale and visual eccentricity may be the trigger for particular catalyst effects within an extended metropolitan area. We will raise the hypothesis, though, that the architectural premise behind the "object" is not one of architectural "image quality", but relates mainly to programmatic givens of economic and social nature.

H2 **The Big Building raises new architectural issues related to functional mix.**

We will raise the hypothesis that the *mix* of functions generated within a Big Building differs from the one normally developed in urban planning and from the *mix* that normally applies to architectural buildings.

Whereas the terms density and *mix* have recently become key-words of the Sustainable Planning, the traditional mixed-use building, combining commercial/ retail uses (at the ground level) and dwellings (on top) – is seen in several historical periods and in the majority of cities around the globe. The Big Building seems to bring together the two concepts and to materialize them within higher complexity standards.

Among its fundamental features, the Big Building embodies an accumulation of different programs, each carrying specific conditions and requirements. We will therefore raise the hypothesis that the exercise of gathering several different programs of a city within a building will imply complex and innovative design challenges. We will see that the strategies applied to the design of programs with opposed levels of privacy (for instance, housing and public equipments, housing and offices) will imply a particular effort on the conception of the transition/articulation spaces, not only in their spatial qualities but also in its practical response to issues such as accessibility, security and privacy. Moreover, the traditional elements of the urban planning – building, street, plaza, courtyard – are subjected to reinterpretation in the planning of a Big Building, transferring to the category of architectural spaces, and keeping their qualities as complex generators of urban life inside the building.

This hypothesis will be verified along the chapter 2 and 3 – Density, Diversity and Mix - and also in the analysis of the core case studies in chapters 4 and 5.

H3 **The planning of housing within the Big Building triggers innovative solutions of collective housing and its related features, such as density, hybridity and mix.**

The term *mix* has recently resurged in the architectural/urban scene, as a key-solution to induce all sorts of exchanges and interactions between people.

Our research will fundamentally explore the relation between the Big Building - a model of urban density - and the construction of an inner reality of density and *mix* – the habitat. The truth is that, despite its small scale, the architectural design of the domestic space bears a process of high complexity. Yet, when that design becomes a small premise within the large universe of the conception of a Big Building, the outcome of the architectural planning of the whole implies a dramatically higher level of complexity. One of our fundamental aims is to understand how these two opposed scales and contrasting intimacy levels – the house and the "city" - can be planned together.

The *mix* of a Big Building evolves from a pre-settled condition of density that envisions the planning of multiple interacting activities inside one building – housing is planned simultaneously with offices, services, equipments or infrastructures - as part of an overall urban strategy to keep neighbourhoods active throughout the different daytimes. We will launch the hypothesis that the architectural design can potentially stimulate the interaction between spaces and users of different activities through the planning of articulation areas.

Gradually, the concept of *mix* is being applied also to social values. We have observed that the recent production of urban planning and innovative collective housing buildings (namely in France and in the Netherlands) recurrently explore a condition of social *mix*, starting from the hypothesis that the spatial proximity leads to the retraction of the social distance, generating an overall environment of social cohesion. We will raise the hypothesis that the social mixture can be explored through the architectural design, by means of breaking with traditional architectural conditions. For instance, "*It is unthinkable that the higher floors are used only for the more expensive apartments, so that the rich are sitting on top of the poor*"[1]. Simultaneously, the social mix is often explored through the innovative planning of mixed housing typologies, allowing for different ways of life within a building and moving forward on the creation of "traditional neighborhoods" and multifaceted social environments inside a building. The effort done towards the variety is often further enforced through the planning of collective courtyards, accessibility or public areas, exploring urban qualities inside the building.

This hypothesis will be verified along the chapter 2 and 3 – Density, Diversity and Mix and also in the analysis of the case studies in chapter 4.

H4 <u>The Big Building triggers new design methods and new challenges, different from the ones of the architectural design or the urban planning.</u>

We have seen above that the Big Building creates particular spatial and functional conditions that can't be observed neither in normal buildings nor in urban planning, opening precedents for the exploration of new systems of articulation and thinking on urban features, functional activities, social environments and domestic spaces – all within an object – that must be solved through innovative design strategies.

The design assets we intend to explore are not confined to the architectural/urban thinking; they imply awareness on the overall process, on the economical and juridical inference and on how these directly affect design decisions; indeed, we will start from the statement that the Big Building can no longer be designed by one architect and must be thought within the universe of the complex thinking.

Along with the theoretical analysis, we seek to construct a universe of directions/ tools, typical conditions and potential issues that may serve as guidelines for the design of housing in Big Buildings.

This hypothesis will be verified along the chapter 2, 3 and 4, and illustrated through our design strategies in chapter 5.

1 MVRDV, *Far Max – Excursions on Density*, 010 Publishers, Rotterdam, 1998, p. 535

1.2.3. Limits and specificities of this research

Although we must acknowledge that some particular factors may bear a decisive impact on the design and definition of housing in the Big Building, some of these aspects would require an in-depth approach that would inevitably extrapolate our area of knowledge or our study field. In that sense, we have decided to state our awareness on the importance of some of these subjects, and yet not to dive deeper on their analysis/exploration. The fundamental subjects we are referring to are listed below:

a) The economical forces and speculation logics defining the design of the Big Building;
From our very early research, we have understood that a substantial number of Big Buildings is defined and built according to political and economical forces of speculation and that their supremacy over the design often asphyxiates the will or the design intentions of the architects. We know that these forces cannot be ignored and that most of our analyses must bear in mind this particular strain, especially because housing is a common target in the speculative markets. However, these dynamics are complex, changeable and unclear, and are very rarely mentioned in the project descriptions. Although some of these points have been approached and discussed in some of the Complex Design work sessions, with the participation of experts in socio-economics, we believe that the subject extrapolates our domain of knowledge.

b) The Big Building as a product of a Global Architecture;
The general concept of Globalization would require a much larger exploration than the one that we have attained on this research. Nonetheless, and besides the vast works that have been published on the theme, we believe that it extrapolates our domains of knowledge and thus we would not be able to achieve enough material to explore the subject accordingly.

c) Differentiating the subject of 'large scale housing buildings' from our subject 'housing in the Big Building';
Although the two subjects might a priori look very similar and share some resemblances, the issues raised by one and the other are significantly different. Whereas 'large scale housing buildings' refer to extremely large housing units conceived 'for the greatest number'- often repetitive schemes built in the suburbs and integrating mostly housing with some services and equipments -, the subject of 'housing in the Big Building' targets the conception of housing within a very particular condition of density and functional diversity which is that of the Big Building - a massive hybrid container implemented in the dense city. Although a more attentive reference to the first model, in particular the soviet 'social condensers' could be interesting to our research, we have decided not to include it in the scope of our historical approach to avoid any possible confusion.

c) An extensive theoretical/historical approach
Having understood quite early that the housing models developed within the

majority of the Big Buildings would be more speculative and simplistic than complex and thrilling, we have decided to increase the initially estimated weight of the historical/theoretical approach of our research, hoping to find, in the past, models and experiments that may elucidate us and inspire us more strongly on the potentials and directions to pursue in the planning of housing within complexity. Moreover, this theoretical approach articulates the present research with the general ambit of the laboratory in which it has been produced (LTH2), benefiting from the knowledge, bibliographic references and material developed at this lab.

d) Keeping the design approach as hypothetical and abstract as possible
After understanding how unclear is, most of the times, the process of designing housing in Big Buildings (as we will see, often the design decisions depend more closely on economical factors and on the will of the developer than on the conception of the architect), we have concluded that proposing a realistic project of housing in the big Building could easily be too naïf and unsystematic as an exercise. Therefore our experimentations will be limited to alternative solutions that have real buildings and real program distributions at their base.

1.2.4. Criteria for the formation of the research corpus

Although our theoretical research is sustained and demonstrated by a wide range of both historical and contemporary case studies that help illustrating particular themes explored in the theoretical formulations, we have early acknowledged the importance of undertaking an in-depth exploration of a restricted corpus of key case studies of Big Buildings. In that sense, three main examples of recent Big Buildings that include housing have been selected, allowing for a more profound identification of the potentials and fragilities of the planning of housing inside Big Buildings.

In order to be able to select and identify these three key buildings, we have used the criteria listed below:

a) The Study Object: Collective Housing within the Big Building.
A first fundamental condition is that the selected examples of Big Buildings contain a significant percentage of housing and, ideally, each one illustrates different strategies of planning housing, as well as different types of housing, within the Big Building.

d) Threshold Size: above 100'000 m^2
The threshold area of 100'000 m^2 has early been defined by the ensemble of researchers at the Complex Design group, as a common base for the selection and study of housing, equipments and infrastructures in Big Buildings. This sheer size is said to be the turning point for the emergence of fundamental issues that eventually change the nature of the design process, its challenges and aspirations. Indeed, from a critical scale, the energetic, financial, construction and program issues often increase dramatically. Nonetheless, the threshold 100'000 m^2 area does

not represent an ideal scale in regards to housing, nor the scale in which innovative housing typologies and neighborhood schemes are normally explored; this forced us to seek for some smaller examples in order to illustrate the qualities we were seeking to implement within the design of the Big Building.

g) Configuration: a compact object with a well-defined shape.
We have done an effort in the sense of selecting buildings that bear witness to what we define as Big Building: a unitary architectural object hosting multiple different programs contained within the apparent stability of a single envelope. We were also eager that each building could illustrate a different type of volumetric scheme: one of them arranged vertically, the other one deployed horizontally and the last one articulating both vertical and horizontal organisation logics.

b) The time period: Present (from 2010 to 2016)
We consider that one of the fundamental assets of our research is the actuality of its study object. In that sense, we have chosen buildings that allowed us to closely track different moments of the process, evolving alongside the development of our research: from conception to construction, completion and actual use. Moreover, we believe that if we are able to investigate the subject at the present moment, our research will have more chances to eventually nurture the conception of future Big Buildings and, ideally, to highlight the importance of a strategic planning of housing within these massive mixed containers.

c) The location: Dense Urban Centres
From our preliminary analyses, we have noted that the Big Building follows a Global architectural trend and its design and architectural features do not get much influence from the context. However, since our aim is fundamentally to analyse conditions of urban density, as well as the potential dynamics and articulations established between the Big Building and the city - the idea of planning 'a city within a city' - we have decided to exclude the study of buildings that are detached from urban centres.
Although our selection is not restrained to the European context, we will notice that some specific preoccupations regarding mix, diversity and density can be identified more strongly here, whereas in Asia, for instance, there's a lot more freedom for risk and architectural experimentation.

h) One Author, one architectural theory, three different models
Although this hasn't been a key parameter for our selection in a first moment, we though it would lend further coherence and vigour to our research corpus the fact that our three main case-studies – bearing similar sizes and yet such interesting formal variations of a same theme - have had the same author, OMA/Rem Koolhaas, at the base of their conception, and that this author also occupies a central role on the theoretical definition of Bigness. At the same time, we find interesting that the writings and theoretical formulations of the author exclude, most of the times, any reference to the interior dynamics of the building and almost never refer to the subject of housing or the true meaning of inhabiting the Big Building.

1.3. Research method

Our research is nurtured by four fundamental sources: 1) theoretical references (main definitions, historical and contextual approach); 2) analyses of three core case studies, from process to completion and actual use; 3) design-based analyses (typical architectural conditions, mainly related to accessibilities, communal spaces and the qualities of the dwelling units); 4) interactions with the Complex Design group. All four progressed on a simultaneous and continuous basis.

1.3.1. Theoretical approach

Our research starts by focusing on the definition of the main subjects that compose the corpus of our investigation – *complexity, density, hybridity and mix* - articulating the theoretical content with the analysis of a selection of exemplary case studies – both historical and contemporary - that help illustrating the themes explored in the theoretical reflections. This selection of buildings also wishes to highlight the different possibilities of articulation with the city, the articulation between different programs with housing, and also internal circulations, privacy and housing models. In order to ensure the consistency of the analysis, the theoretical scrutiny of the different buildings obeys to the following criteria:
a) program mix: the range of different programs and the distribution of functions within the architectural volume;
b) the relation between building and urban fabric / building and public space;
c) the distribution diagram – horizontal, vertical and alternative circulation axes;
d) the relation between housing and the adjoining programs;
e) the exploration (or non-exploration) of typological mix/social mix in the housing areas;
f) the way parking is planned within the building.

1.3.2. Analysis of three main case studies

The selection of our three central cases studies was made according to the criteria described above (*point 5. Criteria for the formation of the research corpus*). The investigation follows similar parameters to the ones that have guided the study of the secondary case studies, but the extension of the analysis is substantially larger, having been fed by visits, interviews, seminars, process analyses, analyses of reports from the developers, interviews with the architects, analyses of articles, analyses of drawings, the identification of problems and potentials, and finally, through the development of alternative design strategies. The study of each case study follows a contextual and typomorphological structure based on the following points:

a) the site and its historical background;

b) the overall process and the different actors (political, financial, juridical, architectural);

c) the functional mix (the nature, quantity and layout of the different programs and the way they are planned and articulated within the Big Building);

d) the public spaces and the treatment of outdoor and transition spaces between the public, semi public and private domains;

e) the condition of living in the Big Building and the way housing articulates with other programs;

f) the housing typologies that are provided in the building;

g) the dwelling unit, studied in terms of its internal distribution (entrance halls, corridors, transition areas, lobbies), the articulation of collective and intimate spaces inside the dwelling, relations between various apartment zones, nature and quality of the exterior prolongations of the apartments, aside with verifying the existence of innovative architectural features and devices that may succeed at reproducing the qualities of the single family house.

The 'Vertical City'

Our first case study, *De Rotterdam* (located in Rotterdam, NL, and designed by OMA/Rem Koolhaas) was one of our clearest choices for it was probably the first built paradigm of *Bigness*[2]. With a sheer size of 162'000 m^2, the 150m high rise building is described as a 'vertical city', having also been declaredly inspired on the massing and hybridity of the Manhattan skyscrapers[3]. This building claims to embody both clarity (given the 'sense of uniformity' of its volume) and synergy between the different spaces and different users, as well as to become a catalyst for the regeneration of the entire Kop van Zuid area. The building includes 21,6% of housing, mixed with offices, hotel, commerce, activities and parking.

The horizontal 'City within the City'

The second case study, the *Entrepôt Macdonald*, is located in Paris. With a total area of 167'000 m^2, this building accommodates predominantly housing (50% of the whole building), half of it representing social housing, designed in diversified typological schemes. Despite confined within a unitary building shape - defined by the volume of the pre-existing warehouse - the building, initially designed by OMA/FAA, is somehow analogue to the planning of a city zone, as it bears a collection of multiple different buildings designed by 15 different architects, each one with its own individual entrance directly from the street. Its length of 600 m lends it attributes of a 'horizontal skyscraper', and a potential effective symbolic weight to become a landmark, as per the project description.

2 Having gone through a long period between conception and completion (1997-2013, due to political and economical reasons), the initial planning of de Rotterdam started shortly after Rem Koolhaas's publication of the Bigness theorem, embodying possibly, in its design and in its unitary gigantic building shape, most of Koolhaas's thoughts on the matter

3 "*However it is true that New York alerted me to some of the potentials of vertical organisation and to some extent this has informed this building. The massing of De Rotterdam would be unthinkable without the buildings of such architects as Wallace Harrison. The Rockefeller Center, to name one example, also shares the sense of uniformity, which is a key element in De Rotterdam*."

Finally, the third case study – *the Interlace*, in Singapore, designed by OMA/Ole Scheeren – is an amalgamate of volumes that articulate both vertical and horizontal logics, recalling the Megastructures published in Reyner Banham's catalogue[4]. With a sheer size of 170'000 m^2, this building contains the highest percentage of housing, and also the most intense exploration of typological diversity, aside with the strategic design of intermediary spaces that intend to activate the spirit of a village and community life in a context of high density.

The three case studies share key common features: a) all three are Big Buildings – massive unitary objects; b) the three have an approximate area: 162'000 m^2, 165'000 m^2 and 170'000 m^2; b) all three contain a high percentage housing; c) all three have been designed, at their origin, by OMA/Rem Koolhaas.

Despite the many similarities that lend coherence to the range of case studies, each case succeeds, in a particular way, to illustrate a specific theme: a) each one illustrates a different volumetric scheme - the the vertical big building, the horizontal big building, and the mega-structure (vertical and horizontal articulation); b) although all three contain housing, the models are completely different: the first one bears a purely speculative repetition of a typical floor plan, the second bears a more social character, half of social housing and the other half housing for sale at affordable cost, and the third presenting a strong focus on housing, typological mix, the quality of apartments and transitional spaces, high standard but affordable; 4) although the three have been designed at its base by Rem Koolhaas, the process and planning modes were drastically different; while the second, having a social character, obeyed cuts, reductions and sectorization, the third was entirely financed by private funds, allowing the preservation of basic purity and innovative concept developed by a single architect.

1.3.3. Design Strategies

This research envisions the simultaneous exploration of theoretical and design-based analyses. In view of the countless uncertainties that surround the subject of Bigness, as well as its complexity, the design may represent a high-powered conceptual tool, allowing for countless hypothetical combinations. In the context of our research, we perceive the design as a useful tool to: a) summarize concepts; b) analyse the actual layout of the case studies (predominantly in section); c) test alternative design hypotheses; d) establish a conclusive graphic toolset of design guidelines.

In that sense, in a first moment (and keeping the awareness on the economical, juridical and political implications that are inherent to any complex project), we will explore alternative design hypotheses departing from the actual design of our main case studies, and yet remain at an abstract conceptual level. In a second moment, we will use the design, under the form of simplified and abstract

4 Reyner Banham, *Megastructure: urban futures of the recent past*, New York, Harper and Row, 1976.

diagrams, to summarize the attained knowledge, willing to establish a set of graphic representations that may summarize our main conclusions and set the key priorities to bear in mind towards an effective design of housing within the Big Building.

1.3.4. Exchanges with the Complex Design research group

This research is part of the Complex Design doctoral program, an extensive research program devoted to the study of complex projects with an intermediary scale between a fragment of a city and an architectural building. They include the study of infrastructure, equipment and housing buildings with a size larger than the threshold area of 100'000 m2. Between 2012 and 2014, our work has benefited from the guidance of the work interaction - sparked by multiple common seminars (some of them organized by the researchers), group travels and workshops. The interdisciplinary character of this research group, bringing together professors and researchers from three Swiss universities and three different domains has been a valuable contribution to identifying the socio-economic and legal context of the current production of housing within the Big Building. It also allowed us to better understand our own discipline across their field of investigation. In many cases, it has helped us to understand in which ways multiple simultaneous forces that extrapolate the domain of architecture end up having a decisive influence on the design of the Big Building.

2. State of the Art

Although the subject *Housing in the Big Building* hasn't yet been object of a specific scientific research, an extensive state of the art on the subject can be composed by means of the identification and exploration of its multiple related subjects. Following that logic, the state of the art of our research will be organized around five fundamental themes: *collective housing, large-scale, complexity, density, mix and hybridization*.

2.1. Collective Housing

Our approach to the analysis of Collective Housing in the Big Building will follow the line of the works that will be mentioned below.

On the general theme of *habitat*, especially from a historical perspective, Christian Moley has published many books[1] in which he seeks to demonstrate the formation of the apartment building and its avatars, and also the various intermediate types between the family house and the collective housing building. He focuses on the analysis of the configuration of the dwelling and its spatial qualities. In his writings, Moley also focuses on the topic of collective housing in terms of the relations between neighbours and the quality of the shared spaces, in the same way that he reveals the significant impact of normative tools in design and changes in domestic spaces. His work is particularly relevant for the numerous insights on the *complexity* of collective housing.

In the subject of *contemporary collective housing*, the writings of Martin Steinmann[2] have contributed largely to a change of thinking on contemporary housing, including through the consideration of the needs and wishes of users. His writings reflect the scope of the research he conducted for several years on the diversity of urban forms, the development of specific housing typologies and the transformation of the urban landscape.

Monique Eleb-Vidal devoted many years to the research on lifestyles and behaviours, particularly regarding the subject of collective housing. Her publications[3] are the result of systematic analyses on the typology of the habitat and the process of architectural design. Amidst the themes explored by the author that relate to our research, one can find: a) the observation of changing lifestyles; b) the analysis of the distributions of domestic spaces, the relationship between spatiality and

1 See: Christian Moley, *Regard sur l'immeuble privé architecture d'un habitat (1880-1970)*, Le Moniteur, Paris, 1999; Christian Moley, *Les abords du chez-soi en quête d'espaces intermédiaires*, Editions La Villette, Paris, 2005.

2 See Martin Steinmann, *Forme forte, Ecrits 1972-2002*, Birkhäuser, Bâle, 2003; Martin Steinmann, Bernard Zurbuchen, (2000). «Habiter aujourd'hui». In: Bruno Marchand, Jacques Lucan, Martin Steinmann, *Construire des logements. L'habitat collectif suisse 1950-2000. cahiers de théorie n° 4-5*; Martin Steinmann et collectif d'auteurs, «Réflexions sur le logement contemporain. Débat entre Michael Alder, Roger Diener, Meinrad Morger, Rainer Senn et Martin Steinmann», *Faces*, nº 28, 1993, pp. 4-9.

3 See Monique Eleb-Vidal, *Urbanité, sociabilité et intimité. Des logements d'aujourd'hui*, Editions, de l'Epure, Paris, 1997; Monique Eleb-Vidal, *Entre voisins. Dispositif architectural et mixité sociale*, Editions de l'Epure, Paris, 2000.

lifestyles; c) the evolution of certain values as togetherness and privacy, and how they translate into architectural features like the living room, bedroom, children 's room, bathrooms, etc.; d) the necessary adjustment of the real estate practices to give people the opportunity to identify with their living environment.

The issue of *architectural innovation* is also important in our research, as we expect to identify it in the type of housing planned inside Big Buildings. During the latest decade, it is clearly identifiable in collective housing projects developed within the framework of competitions[4], with visible changes in urban forms and housing plans. The theme of architectural innovation in collective housing has also been the object of relevant publications like the ones of Bernard Huet[5] or Christian Moley[6].

2.2. Large-Scale

One must start by defining the concept of *scale* as a tool to measure the size of a given object. The subject of scale in architecture is approached by Philippe Boudon, who highlights the importance of references and relativity on the definition of scale[7]; scale can only be measured by comparison with other reference objects. When the Big Building is the study object, our main reference is the city and the urban fabric and, in this context, we necessarily understand the Big Building as a 'boundary object', a designation introduced in the social sciences by Susan Star and James Griesemer in 1989[8].

2.2.1. Large-Scale and Collective Housing

It would be impossible and illusory to list all the abundant theoretical writings on this subject. Therefore, we have restrained our analysis to a small selection of publications and oeuvres that have helped us understanding the distinction between the large-scale housing building and the Big Building. The whole architecture of the twentieth century gravitates around the subject of *large-scale*. Mass society, industrial production and large-scale are therefore closely interconnected subjects.

4 See Bruno Marchand, Antingoni Katsakou, *Concevoir des logements - Cahier de théorie n°6*, Presses Polytechniques Universitaires Romandes, 2008; Bruno Marchand, Alexandre Aviolat, *Logements en devenir - Concours en Suisse 2005-2015, Cahier de théorie*, Presses Polytechniques Universitaires Romandes, 2015.

5 See Bernard Huet, Michèle Lambert et JeanYves Toussaint, *Le logement collectif contemporain*. PCA Paris, 1990.

6 Christian Moley, *Regard sur l'immeuble privé architecture d'un habitat (1880-1970)*. Le Moniteur, Paris, 1999; Christian Moley, *Les abords du chez-soi en quête d'espaces intermédiaires*. Editions La Villette, Paris, 2005.

7 See Philippe Boudon, *De l'architecture à l'epistémologie: la question de l'échelle*, Presses Universitaires de France, Paris, 1991.

8 *"Boundary objects are objects which are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. They may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is key in developing and maintaining coherence across intersecting social worlds.",* in Susan Star, James Griesemer, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology", *Social Studies of Science*, vol. 9. Issue 3, 1989, p. 393.

There should nonetheless be an ideological distinction on the scale, as it unfolds into different contexts and building types. For the German rationalism, large-scale was the result of the imperialist policy and the stimulating capacity of some large forms (see the typological experiments of Walter Gropius, the great neighbourhoods of Bruno Taut or theoretical extremism Hilberseimer). For Constructivism, scale symbolizes the effort of a country in search of a productive reason in the service of the economy. In the 1930s, some important experiments in housing arose, such as Moisei Ginzburg's soviet *social condensers*, containing minimal *dom-komuna* units (minimum scale dwelling units), and opening the reflection on the idea of collective living through its shared common services. These experiments have partly inspired the conception of Le Corbusier's *Unité d'Habitation* (between 1947 and 1952), where the concept of living in community has been explored through the planning of community spaces and services within the building. Indeed, the *Unité d'Habitation* is our first paradigm of *housing in a big building*, bearing witness to the concept of urbanity planned vertically aside housing within one envelope, and the appropriation of elements that are basic elements of urbanism, as for instance the street, the shared/public space or the playground. The two paradigms mentioned above have influenced, later, a larger model that has repeatedly been constructed in Europe. After the Second World War, several European countries have been confronted with a high demand for the construction of housing buildings within a short time. Thus, from the late 1950s onwards, building dimensions suffered a radical increase in size and housing complexes have been developed within gigantic, ramified and repetitive morphologies (known in France as *grands ensembles*), with examples such as the Bijlmermeer in Amsterdam (1970), the Corviale in Rome (1975) or the Robin Hood Gardens in London (1972), among many others[9]. These complexes were, for the most part, built in vast suburban parcels of land in the outskirts of the cities. The demand for a quick and economically efficient construction implied the standardization of the ensemble, from the housing typologies to the constructive details, which resulted in giant façades of a dull regularity[10]. All together, their suburban situation, their giant rigidity and the demanding maintenance costs added of its exclusive use as (social) housing, are pointed as causes for the failure of most of these complexes and for their decay into ghettos. This collective image is portrayed by Sandra Parvu[11], who not only describes their initial features, but also the phenomenon that automatically connects the negative aspects of the building to its form and by Françoise Choay[12] who explores the issue of architectural heritage on the topic of how to deal with the *grand ensemble* heritage today. What we will verify later is that such constructions have left us several important reflections on the

9 See for instance Frédéric Druot, Anne Lacaton and Jean-Philippe Vassal, *Plus : la vivienda colectiva : territorio de excepción = les grands ensembles de logements : territoire d'exception = large-scale housing developments : an exceptional case,* Gustavo Gili, Barcelona, 2007; Wolfgang Förster, *Housing in the 20th and 21st centuries = Wohnen im 20. und 21. Jahrhundert*, Prestel, Munich, 2006.

10 Frédéric Frank, « The resurgence of the large form », *in* Martin Blas, Pajares Sanchez & Ruiz Cabrero, *Casas en Suiza*, ETSA, Madrid, 2013

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11 Sandra Parvu, « Grands ensembles en situation », *Journal de bord de quatre chantiers*, Genève: MetisPresses, 2010.

12 Françoise Choay, *Le patrimoine en question , Anthologie pour un combat*, Paris, Seuil, 2010.

challenges associated to large-scale monofunctional buildings, and actually most of the principles that the large-scale productions follow today tend to contrary the features of the old *grands ensembles*. Several architects wrote about this problem at the time, many of them addressing all the troubles triggered by the large form to the architectural planning, thus disparaging the architectural production developed between 1945 and 1975. Against those tendencies, Stanislaus von Moos tried to avoid a complete rejection of the theories of the Modern Movement, suggesting that the base of the problem wasn't the architecture nor the large-scale: "*Those who knew it all along that large scale housing blocks "cannot" work should, however, not be too triumphant. Almost all the articles of the present issue show that the debacle of certain large scale public housing complexes has little or nothing to do with the particular building type chosen, but much with politics, financing, social planning, equipment, etc*"[13]. The work of Hilary French[14] bears a relevant selection of housing buildings produced during the entire twentieth century and in many different contexts, allowing for a good overview on the different trends. Likewise, the a+t research group does an interesting graphical analysis of a selection of large scale collective housing buildings of the twentieth century in the book *10Stories of collective housing*[15], which includes the Barbican (London, 1955-1983) and the Norkomfin building (Moscow, 1932), the Justus van Effen Complex (Rotterdam, 1922), Luigi Moretti's multi-purpose complex in Milan (1956) or Fumihiko Maki's Hillside Terraces (Tokyo, 1967-1998), among others. These publications may denounce a resurgence on the fascination for the large-scale production of the twentieth century. Indeed, several recent publications such as the one by Franz Graf on *La cité du Lignon*, Rem Koolhaas's latest book *Project Japan*, Lucio Barbera's *Corviale Accomplished*, Bruno Krucker and Stephan Bates's compilation on *The Robin Hood Gardens* are only a few examples to prove today's renewed interest on the large form.

2.2.2. Large-Scale and the Big Building

As explained in the introduction, the issues raised by our subject Housing in the Big Building are very different from the issues related to Large-scale Collective Housing, having more to do with functional mix, circulation, privacy and articulation. In that sense, our research may relate more closely to the buildings produced in the US than to the monofunctional and repetitive examples mentioned above. Some of these are documented in the catalogue *Hybrid Buildings*[16], developed by Joseph Fenton in 1985, who worked with Steven Holl, mapping for the first time a characterization of large mixed-use buildings, catalogued according to their different morphological typologies. Earlier, in 1980, in *The Alphabetical*

13 Stanislaus Von Moos,"Grossuberbauungen", *Werk-architese*, nº5, 1977, p.1.

14 See Hilary French, *Key urban housing of the twentieth century*, King publishing, London, 2008.

15 See Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10Stories of collective housing – graphical analysis of inspiring masterpieces*, a+t research group, Vitoria Gasteiz, 2013.

16 See Joseph Fenton, *Hybrid Buildings - Pamphlet Architecture*, Princeton University Press, New York, 1985.

City[17] Steven Holl had investigated the essence of American architecture in its programmatic and spatial wealth, with the intention of exploring the correlation between building types and urban plots.

The book *Megastructure: urban futures of the recent past*[18], 1976, by Reyner Banham embodies an ode to the large scale, providing a guided catalogue for the megastructure projects conceived (a few of them constructed) in the mid twentieth century: "*the concept of a giant, adaptable, multi-purpose building containing most of the functions of a city*". This book collects important projects of the time such as the ones from the Japanese Metabolists, Team 10, Yona Friedman, Archigram, Archizoom, Buckminster Fuller and many others, that have had great influence on other buildings constructed until our days.

The issue of the Scale has been theorized and re-introduced in the contemporary architectural scene by Rem Koolhaas. From his rise to fame in 1978, after publishing *Delirious New York*, to his most contemporary production, the question of scale has been a recurrent topic in the architectural and theoretical production of the author - indeed, "*everything in Koolhaas's work seems to depend on this size issue*"[19]. The term Bigness has glaringly been defined in an architectural context by Koolhaas in 1997, in his book S,M,L,XL: "*Beyond a certain scale, architecture acquires the properties of Bigness*."[20] The publication of S,M,L,XL and the completion of Euralille by Rem Koolhaas, both in 1995 have inspired several papers in the subject, recurrently placing Koolhaas's theories at the core of the debate. His thoughts around the large-scale issue are crystallized in an essay published in Domus in 1994: "Bigness or the problem of large". One of the themes explored by Koolhaas is, indeed, the query of scale an the way it relates both to the disciplines of architecture and urbanism: what's the critical size from which architecture turns into urbanism? If any, can such architecture substitute itself to urbanism?

Koolhaas connects the debate to a sense of autonomy and rejection of Bigness towards the city "*Bigness is no longer part of any urban tissue*"[21] as it actually "*competes with the city*" [22]. Pier Vittorio Aureli takes another particular position in this debate, in *The possibility of an absolute architecture*[23]. For Aureli, an *absolute architecture* is like *an island within the city*: separated from (but certainly not free from) the city.

17 See Steven Holl, *The Alphabetical City - Pamphlet Architecture*, Princeton University Press, New York, 1980.

18 See Reyner Banham, *Megastructure: urban futures of the recent past*, New York, Harper and Row, 1976.

19 Bruno Latour, « En tapotant sur Rem Koolhaas avec un baton d'aveugle », *Architecture d'Aujourd'hui*, Nov-Dec 2005, n°361, pp. 70-79.

20 Koolhaas, Rem, Bruce Mau, « Bigness or the problem of Large », in *S,M,L,XL*, op. cit., p. 495.

21 Rem Koolhaas, "Bigness or the problem of large", OMA, Koolhaas, Mau, in *S,M,L,XL*, Monacelli Press in New York, 1995, pp. 502-503.

22 *Ibidem*.

23 See Pier Vittorio Aureli, *The Possibility of an Absolute Architecture*, The MIT Press, Cambridge, Mass, 2011.

2.3. Density

The concept of density has never been easy to define, as its indicators vary constantly according to social and cultural factors, and most of them can only be quantified through "sensitive" approaches. It is certain that the concept of density isn't felt identically by an inhabitant of New York, Honk Kong or Lausanne, who are faced with completely opposed social and built backgrounds; simultaneously, different personal experiences molded by different cultural environments, result on different ways of perceiving one same density[24].

As a consequence of changeable social, economical and urban conditions, throughout the twentieth century, the concept of density has become increasingly complex, starting from an objective definition - derived uniquely from numbers - to a new definition that touches more sensible extents[25]. Indeed, since late 1960s, an approach to density relating to numbers has progressively been enriched with a «sensitive approach», a contribution brought to scene by fundamental researchers in urban sciences[26]. Amos Rapoport's works and simultaneous approaches of the topics of density and complexity[27] can bear important contributions for our analysis of the Big Building, as these connect spatial complexity with individual perception, stating that "*humans prefer ambiguous complex patterns in their visual fields*"[28]. These seminal works have been re-approached later by Vincent Fouchier throughout the 1990's[29], but it was only later that the above mentioned « sensitive approach » has been applied to Housing programs, through the research of Martin Steinmann[30].

In recent years, the influence of the density in collective housing is triggering more and more questions, especially because the requirements of Sustainable Planning have highlighted the disastrous aspects of the urban sprawl in terms of energetic consumption, the destruction of agricultural land and natural ecosystems[31]. The

24 See Bruno Marchand, « La densité, Un défi culturel », *Cahiers de l'aspan-so*, n.1, 2012; Amos Rapoport, «Toward a Redefinition of Density», *Environment & Behaviour*, vol n°7, 1975.

25 Bruno Marchand, « La densité, Un défi culturel », *Cahiers de l'aspan-so*, n.1, 2012; Bruno Marchand, Frédéric Frank, « Densité, Vers la complexification d'une notion », *Heimatschutz-Patrimoine*, n.1, 2012.

26 See Robert Schmitt, « Density, Health and Social Organization », *Journal of the American Institute of Planners* n°32, Washington, 1966; Claude Fischer, Baldassare M., Ofshe R.J., « Crowding Studies and Urban Life : A Critical Review », *American Institute of Planners*, 1975; Amos Rapoport, «Toward a Redefinition of Density», *Environment & Behaviour*, vol n°7, 1975.

27 Amos Rapoport, Ron Hawkes, "The perception of urban complexity", *AIP Journal*, 1970.

28 Amos Rapoport, Robert Kantor, "Complexity and ambiguity in environmental Design", *AIP Journal*, 1967.

29 Vincent Fouchier, *Les densités de la ville nouvelle d'Evry* , Anthropos, Paris, 2000 ; Vincent Fouchier, *Les densités urbaines et le développement durable, le cas de l'Ile-de-France et des villes nouvelles* , SVGN, Paris, 1998 ; Vincent Fouchier, Pierre Merlin, *High Urban Densities, a Solution for our Cities?* , Consulat gén. de France à Hong Kong, Hong Kong, 1994.

30 See Martin Steinmann, Inès Lamunière, « Densité », *Faces* n°40, 1996; Martin Steinmann, « De la perception de l'espace », in matières, n.9, Lausanne, 2008; Martin Steinmann, « Espaces et expériences», in matières, n.7, 2004 ; Martin Steinmann, «Densité des expériences sensibles», *werk, bauen+wohnen*, n°10, 2002.

31 See Kenneth Jackson, *Crabgrass Fontier, The Suburbanisation of the United States*, Oxford University Press, New York, 1985; Peter Newman, Isabella Jennings, *Cities as sustainable ecosystems : principles and practices*, Island Press, Washington, 2008; Peter Newman, Jeffrey Kenworthy, *Sustainability*

reflections on urban concentration have firstly emerged as a reaction against the principles of the modern urbanism, re-introducing the ideas of vertical urbanism against the strict zoning definition, but mainly reinstalling high-density levels in the city. Contrasting with the dogmatic forms of modernism – the towers, the slab buildings, etc. – new disparate approaches have emerged in the latest decades, based on the principle of architectural hybridization.

The ambiguous understanding of this subject by architects and urban planners has triggered the launch of acclaimed publications such as the *Density series*[32], published by *a+t* since 2006, and also some other recent works that reproach the query of density[33]. These books provide an important catalogue of dense Collective Housing and question the issue of architectural design planed within high density environments. These publications have incited deeper researches on the subject of the theory of density in collective housing, to which Bruno Marchand has largely contributed with his researches and his wide number of publications.

2.4. Diversity and Mix

The general concepts of *diversity* and *mix* have recently become fundamental dictums for the majority of today's urban planning strategies, a phenomenon observed by Jacques Lucan[34]. This diversity refers simultaneously to functional, social and generational parameters[35]. Indeed, mixing strategies represent key ways of enabling the principles defined by Sustainable Planning, as they set up multifunctional devices with a centripetal strength on their urban context and counteract the private interests that could incite the urban sprawl.

Designed as a model capable of economizing resources, especially when it embodies residential uses, the Big Building represents "*a chance sample that includes the gene of the mixed-use development in its code*"[36]. Within the Big Building, the concept of *mix* can be observed at two different levels: the *mix* of

and cities : overcoming automobile dependence, Island Press, Washington, 1999; Peter Newman, Jeffrey Kenworthy, *Cities and autombile dependance : an international sourcebook,* Aldershot, Gower, 1989 .

32 See Aurora Fernandez Per, Javier Mosas, Javier Arpa, *Density is Home*, a+t, Vitoria-Gasteiz, 2011; Aurora Fernandez Per, Javier Mosas, *Next, Collective Housing in Progress*, a+t, Vitoria-Gasteiz, 2010; Aurora Fernandez Per, Javier Mosas, Javier Arpa, *Hoco, Density Housing Construction & Costs*, a+t, Vitoria-Gasteiz, 2009; Aurora Fernandez Per, Javier Mosas, Javier Arpa, *D-Book, Density, Data, Diagrams, Dwellings*, a+t, Vitoria-Gasteiz, 2007 .

33 See Aurora Fernandez Per, Javier Mozas, Alex Ollero, Aitor Deza, *Why density?*, a+t, Vitoria-Gasteiz, Spain, 2015; Aurora Fernandez Per, Javier Mosas, Javier Arpa, *Density is home*, a+t research group, Vitoria-Gasteiz, 2011; Aurora Fernandez Per, Javier Mozas & Javier Arpa, Next, *Collective Housing in Progress*, a+t, Vitoria-Gasteiz, 2010; Aurora Fernandez Per, Javier Mozas & Javier Arpa, Hoco, *Density Housing Construction & Costs*, a+t, Vitoria-Gasteiz, 2009.

34 See Jacques Lucan, *Où va la ville aujourd'hui ? Formes urbaines et mixités*, Editions de la Villette, Paris, 2012.

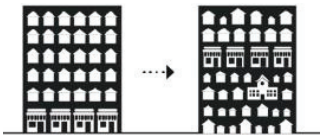
35 See "Mix(cite) Une formule À reinventer", in AMC MIX(CITE) Villes en Partage, 2012, p.6 : "*La recherche de mixité sociale est considérée comme un des points fondamentaux des politiques urbaines et s'est traduite en France depuis des années par un effort continu sur le terrain de l'habitat. Mixité des fonctions et mixité générationnelle sont aussi devenues des aspirations collectives dans une société qui reste confrontée à la spécialisation des territoires et à l'individualisme des comportements humains*."

36 Aurora Fernandez Per & Javier Mozas, "Hybrid III. Residential Mixed-Use Buildings", *a+t* n.33/34, 2009.

uses (the coexistence of several disparate programs) and, in some cases, the *mix* of housing (social, generational, typological).

By mix we understand more than the mere coexistence/stacking of different functions, but rather the proportion, exchange and articulation between different uses and users within a building. As stated by Monique Ruzicka-Rossier: « *la mixité n'est que la mesure d'un mélange (…) c'est aussi une valeur quantitative, le rapport de proportion entre des groupes d'individus, entre des objets, entre des activités, entre des usages*. »[37] An exercise of clear diagrammatic quantification of different programs, quantities, users and areas has been accomplished, for several large scale mixed use buildings, in the a+t *Hybrid* series[38], published since 2008 and recently compiled in the book *This is hybrid*[39].

2.5. Functional Mix



The quintessential model of mixed-use housing building containing housing, combining commercial/retail uses (at the ground level) and dwellings (at the higher levels) has been analysed by Howard Davis in *Living Over the Store Architecture and Local Urban Life*[40]. The author describes exemplary historical and contemporary projects where retail and housing programs coexist, in line with the work of Nikolaus Pevsner in *A History of Building Types*[41]. The principles of functional mix are explored also in Iñaki Ábalos & Juan Herreros's study on towers[42], focusing on the scrutiny of the relationship between multifunctionality, envelope and footprint. They classify their selection of high-rise buildings as a synthetic and dense solution for the organization of disparate functions. They underline the fact that these buildings are the result of an overall system of density and urban growth, contrasting with the planning strategies that we have seen in the past, where the number of inhabitants of a complex used to determine all contiguous functions; and functions where planned to serve inhabitants within a closed system.

Yet, the concept of *mix* that we are aiming to explore envisions not only the mix of housing with other programs and its articulation spaces, public and private spaces, internal and external users, but also the mix of housing typologies, as well as the social mix that can potentially be generated by means of a planned typological and constructive diversity.

37 Monique Ruzicka-Rossier, « La diversité oubliée », *Les Cahiers de L'Aspan* n.13, 2013.

38 Aurora Fernandez Per & Javier Mozas, "Hybrids I. High-Rise Mixed-Use Buildings", *a+t* n.31, 2008; Aurora Fernandez Per & Javier Mozas, "Hybrids II. Low rise Mixed Use Buildings, *a+t* n.32, 2008; Aurora Fernandez Per & Javier Mozas, "Hybrid III. Residential Mixed-Use Buildings", *a+t* n.33/34, 2009;

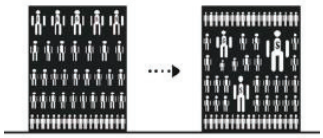
39 Aurora Fernandez, Javier Mozas & Javier Arpa, *This is Hybrid*, A+T, 2014
.

40 See Howard Davis, *Living Over the Store Architecture and Local Urban Life*, Routledge, London, 2012. His work aims to help designers dealing with mixed-use buildings.

41 Nikolaus Pevsner, *A History of Building Types*, Thames and Hudson, Washington, 1976.

42 Iñaki Ábalos, Juan Herreros, *Tower and Office: From Modernist Theory to Contemporary Practice,* Mass: MIT Press, Cambridge, 2003.

2.6. Social Mix



The recent production of urban planning and innovative collective housing buildings recurrently aspires for the incitement of social *mix*, starting from the belief that the spatial proximity of different inhabitants leads to the reduction of social distances and generates an overall environment of social cohesion, an idea that is underlined by Françoise-Hélène Jourda [43]. This same concept of habitat as a tool for social transformation is tested by Monique Eleb & Jean-Louis Violeau in a social study at the Maison Radu, in Saint-Nazare[44].

Simultaneously, architects use design tools to test and explore that same hypothesis. For MVRDV, social and typological mix have become core themes, clearly identifiable at their residential buildings. Thus, the social *mix* is often explored through the innovative planning of mixed housing typologies, allowing for different ways of organizing life within a building and moving forward on the creation of 'traditional neighborhoods' and multifaceted social environments inside each building. The effort done towards this variety is often further enforced through the planning of collective courtyards, accessibility or public areas, exploring urban qualities inside the building, and also through the testing solutions that oppose the traditional models: "*it is unthinkable that the higher floors are used only for the more expensive apartments, so that the rich are sitting on top of the poor*"[45].

The recent work of Bruno Marchand and Christophe Joud in MIX [46] not only highlights the typological mix as a clear trend on the current conception of housing buildings, but it also suggests forms of understanding the different strategies of mix.

2.7. Hybridization

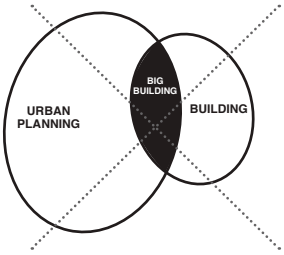
While attempting to assign a definition to the term 'hybrid', Hubertus Adam recalls the Greek origin of the word (*hybrid: creature of mixed blood*), following with a definition applied to architecture - "*la notion de ce qui est hybride en architecture s'applique à différents phénomènes (…) tous ont cependant en commun que ce qui est disparate et initialement séparé est rassemblé en un tout bâti ou un tout*

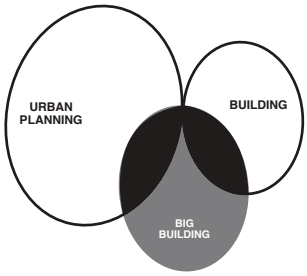
43 Françoise-Hélène Jourda, "Diversifier l'habitat pour rapprocher différents modes de vie", *AMC MIX(CITE) Villes en Partage*, 2012, p.17.

44 See Monique Eleb & Jean-Louis Violeau, *Entre Voisins - Dispositif architectural et mixité sociale*, Les Editions de l'Epure, Paris, 2000; Monique Eleb and Jean-Louis Violeau, « Dispositifs architecturaux at mixité sociale » in *Diversité sociale ségrégation urbaine mixité*, PUCA, Lyon, 2008
.

45 MVRDV, *Far Max – Excursions on Density*, 010 Publishers, Rotterdam, 1998, p. 535 ; See also : MVRDV & Nobuyuki Yoshida, *MVRDV Files : projects 002-209*, a+u Publishing, Tokyo, 2002 ; MVRDV, *MVRDV 1991-2002 : stacking and layering = apilamiento y estratificación : artificial ecologies = ecologías arteficiales*, El Croquis, Madrid, 2003.

46 See Bruno Marchand, Christophe Joud, *Mix: Mixité Typologique du logement collectif – de Le Corbusier à nos jours*, PPUR, Lausanne, 2014, p. 5: "(...) *force est de reconnaître que la mixité, qu'elle soit programmatique, sociale, intergénérationnelle ou typologique, est dans l'air du temps*."





urbain"[47] – and associating it then with the idea of complexity - "(…) *ce qui est hybride dans le domainde de l'architecture l'est en réponse à un environement où se superposent la tendance à une complexité croissante et une individualisation en progression constante*."[48] Two main definitions should indeed be highlighted: *hybrid* as a result of *merging distinct elements into a united whole* and *hybrid* as *a response to an increasingly higher complexity of the context*[49]. Martin Musiatowicz adds that the re-emergence of the hybrid building results from "*the current boom in high density buildings*"[50] and that tackling the subject of hybrids represents an effort to "*keep up with society's pulse*"[51] whose features are constantly changeable and ambiguous.

In architecture, hybridization is an outcome of a complex *functional mix*[52]. The mixed-use phenomenon has become popular amongst the American buildings that Joseph Fenton has collected and theorized under the concept of "functional hybrids"[53]. Referring to an analogy with the biological definition of the term, Fenton no longer sees a building as a whole, but rather as an association of different spaces, connected vertically through new "temporal" transitions: the elevators. In fact, considering the grid as the base that determines the external volume (extruded vertically), functions had only to be selected and piled until the pre-established envelope was filled, with no particular expressions in the façade.

Yet, the concept of hybridization seems to have evolved since then, and it is now increasingly related to the building's morphological features. The truth is that the main attribute of today's hybrid seems to be the fact that it differs from any familiar architectural archetype and, thus, it triggers a feeling of *strangeness*. The archetypal shape of the housing building, the shape of the theatre, the shape of the commercial building get often merged into one peculiar new shape. A renowned architect of Big Buildings and author of theoretical writings in the subject of *hybrids*, Steven Holl, refers to that *strangeness* confessing that his projects bear witness to the intentional creation of a completely new identity: "*I use the principles I described in Anchoring, developing hybrids to create an identity unique to the circumstances of the project*"[54]. In the *a+t series*, an interesting point is made: hybrids are not only

47 Hubertus Adam, "Hybrid Strukturen = Hybrid Structures", *Archithese* n.3, 2000, p.5.

48 *Ibidem*.

49 Antigoni Katsakou, *Recent Architectural Competitions for Collective Housing in Switzerland: Impact of this Framework on Architectural Conception and Innovation*, Thèse nº 5066, EPFL, 2011, pp. 209-243.

50 Martin Musiatowicz, « Vigor hibrido y el arte de mezclar = Hybrid vigour and the art of mixing », *in Hybrids I*, a+t, Vitoria-Gasteiz, 2008, pp. 4-17.

51 Announcement concerning the launch of the « Hybrid » series online, by the authors. Source: http://aplust.net/tienda.php'seccion=revistas&serie=Serie Hybrids (15.08.2016).

52 Due to its exceptional character and dimensions, the Big Building forces the creation of several hybrid models in many different fields; from ownership (multiple different owners and users), to economy (the public-private partnerships), to law (special contracts made to adapt the normal building regulations), each new format differs from the previous. Our focus, though, will remain at the analysis of the hybrid effects that can be observed within the architectural subjects.

53 Joseph Fenton, *Hybrid Buildings*, op. Cit.

54 Everardo Jefferson, « Holl in Hybrids », *Architectural Design* vol. 75, nº5, 2005, pp. 78-83.

an effort to deal with diversity, but to revitalize entire neighborhoods, as they "*set up devices able to excerpt a strong centripetal force on their surrounding elements and activities, so that they counteract the effect of the centrifuge force produced by mainly private interests that incite the city sprawl*."[55]

Aside with the multiple uses, we can often observe the phenomenon of a multiple authorship. Indeed, an interesting point on the subject of the visual strangeness has been theorized in the essay "Hybridization" by Ben van Berkel and Caroline Mos, and justified through an hybridization of the authorship in the architectural conception: "*The Manimal was produced by one artist, but looks like the product of a group*"[56]. Indeed, some Big Buildings are currently being planned simultaneously by several architects, creating some sort of ambiguity both in the overall aspect of the form and in the close way its conception relates to traditional urban planning.

The subject of hybrids has become quite popular in the latest years. The recent branch of *a+t* publications focuses exclusively on the topic of *Hybrids*[57] and provides quite a complete catalogue of recent projects and articles on the matter, as well as a careful representation of each program. Nonetheless, the way in which housing program, in itself, is illustrated or analyzed in diagrams and essays is frankly underprivileged and the displayed architectural drawings leave housing plans behind most of the times. It is also hard to find written references to the character and functioning of housing inside hybrid buildings, which is the field where this thesis aims to be adding knowledge.

2.8. Complexity

The general concept of *complexity* is often defined as a non-linear logic of thinking that derives from the confluence of diverse interacting parts. Thus, *complexity* must be tackled within a multi-dimensional approach and considered as a constantly changeable system. In the book *Introduction à la Pensée Complexe*[58], Edgar Morin describes complexity as a fabric (complexus: *what is woven together*) of "*heterogeneous yet inseparably associated components"*, raising "*the paradox of the one and the many*" as an echo to the thoughts of Blaise Pascal[59]. For him, complexity is indeed an intricate "*fabric of actions, interactions, determinations and hazards that constitute our phenomenal world"*. Morin's thoughts may recall as well the concept of Rhizome, a theory by Gilles Deleuze and Félix Guattari that

55 Announcement concerning the series « Hybrids » on the review's site. *op. cit.*

56 UN Studio – Ben van Berkel & Caroline Bos, « Hybridization », *Techniques: network spin, Move vol. 2,* Goose Press, Amsterdam, 1999.

57 Aurora Fernandez Per & Javier Mozas, "Hybrids I. High-Rise Mixed-Use Buildings", *a+t* n.31, 2008; Aurora Fernandez Per & Javier Mozas, "Hybrids II. Low rise Mixed Use Buildings, *a+t* n.32, 2008; Aurora Fernandez Per & Javier Mozas, "Hybrid III. Residential Mixed-Use Buildings", *a+t* n.33/34, 2009; Aurora Fernández Per, Javier Mozas & Javier Arpa, *This is Hybrid*, a+t, Vitoria-Gasteiz 2014.

58 Edgar Morin, *Introduction à la pensée complexe*, Editions du Seuil, Paris, 2005.

59 "Je ne peux pas concevoir le tout sans concevoir les parties et je ne peux pas concevoir les parties sans concevoir le tout", Blaise Pascal, *Pensées*, Folio, Paris, 2004.

refers to principles of multiplicity and mutualism, and to "*ceaselessly established connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles*."[60] Beyond the definition, Morin suggests tools to decipher complex thinking, by stating that complexity requires the recognition of the irreducible elements; these may then be organized through hierarchy or through grid systems that allow for placing contents together, relating them and eventually triggering the discovery of new patterns.

Although any architectural exercise implies a certain form of complexity due to the constant correlation between the whole and the parts[61], within the study of the Big Building we will focus on two forms of complexity: one that has to do with the process (the multiplicity of actors and temporalities), and a form of complexity that has to do with the internal logics of circulation and articulation between different parts, aiming for the creation of a wealthy relational system.

Rem Koolhaas introduces the idea of *Complexity* as a fundamental condition of Bigness, relating it to the size, the diversity and the development of the project. As a first statement, Rem Koolhaas establishes a direct relation between size and complexity: "*It seems incredible that the size of a building alone embodies an ideological program, independent of the will of its architects.(...) only Bigness instigates the regime of complexity that mobilizes the full intelligence of architecture and its related fields*"[62]. In a second moment, Koolhaas identifies complexity within the process, claiming that the Big Building illustrates *"some properties of the evolution of complex systems and, in particular, the difficulty of governing a development determined by multiple interacting elements"*, an idea that is confirmed by Jean-Paul Baietto concerning the conception of Euralille in the 1990s[63].

An aspect that is important to allude to, though, is that Rem Koolhaas's theories never refer to the 'spatial inside' of *Bigness*, disregarding the complexity associated to the coexistence of multiple interacting users, spaces and activities.

A different approach is the one that had been explored earlier by Alison and Peter Smithson, who have departed from a critical reaction against the simplistic functional segregation of the Athens Charter, and developed strategies to bring *complexity* back to architecture, exploring urban elements and complex social interactions inside buildings[64]. Such complexity has been illustrated by the Team

60 Gilles Deleuze & Felix Guattari, *A Thousand Plateaus*, University of Minnesota Press, Minneapolis 1987, p.7.

61 See Bernard Huet, Anne Lambrichs, Maurice Culot, *Anachroniques d'architecture*, Bruxelles, Éditions des Archives d'Architecture Moderne, 1981, p. 81.

62 Rem Koolhaas, "Bigness or the problem of Large", in *S,M,L,XL*, the Monacelli Press, New York, 1995

63 "*To create something worthwhile at the end of the 20th century, (…) you have to establish in your domain a* dynamique d'enfer… *So complex become all the interconnections, the mutual dependencies, the proliferation of interfaces, the superimposition of users and owners so that together they form a group of prisoners, shackled by mutual obligation, exacerbated by the complexity that you offered unwittingly.*" Jean-Paul Baietto, OMA client, in conversation with Rem Koolhaas about the Euralille project. Rem Koolhaas, *S,M,L,XL, op. cit.*

64 Bruno Fayolle-Lusac, Rémi Papillault, *Team X Et Le Logement Collectif à Grande Échelle En Europe : Un Retour Critique Des Pratiques Vers La Théorie*, MSHA, Pessac, 2004; Bruno Krucker, *Complex Ordinariness : the Upper Lawn Pavilion by Alison and Peter Smithson*, Gta., Zürich , 2002.

10 in the *Brubeck diagram*, as "*a constellation with different values of different parts in an immensely complicated web crossing and recrossing the system*"[65]. "Cluster" was the term launched by the architects, in the fifties, seeking to illustrate an urbanism that would be "*more complex and less geometric*" [66] than the modern urbanism; the Cluster embodied the idea of "*a close knit, complicated, often moving aggregation, but an aggregation with a new distinct structure*."[67]

Such thoughts have evolved into increasingly complex architectural models, such as the *mat-building,* that again "*seemed to use new tools to dismantle the compositional principles of the early modern period*"[68]. The *mat-building* was a scheme based on *"interconnection, close-knit patterns of association with endless possibilities for growth, diminution and change, where social interaction was likely to occur"*. Moreover, the mat-building model has inspired the Team 10 group to produce other relevant projects. The unbuilt project for the reconstruction of the heart of Frankfurt-Römerberg was one of them. Conceived by Candilis, Josic, Woods and Scheidhelm, a flexible megastructure, a compositional network that adapts to the city and its transformations.

Despite equally renowned for the exploration of the subject of complexity in architecture, Robert Venturi's approach sets away from the complexity associated to our research subject, as it focuses rather on the formal features of buildings and in an overall urban perception of architecture: "the whole". In the last chapter of Robert Venturi's *Complexity and Contradiction in Architecture*[69] - "The Obligation Toward the Difficult Whole"- Robert Venturi refers to *the difficult whole* found in *an architecture of complexity and contradiction*, linked to the multiple and diverse elements related to each other in ways that are hard to measure or quantify.

"The whole" was becoming problematic, as the architecture of complexity and accommodation wasn't forsaking the whole (Robert Venturi, 1966). According to Koolhaas, the quality of Venturi's book was to release such oppressions. And indeed, in some points, this idea of whole is mentioned by Koolhaas while referring to Bigness. The new theory seems to aspire indeed to reach a new whole: "*the whole after the crisis of the whole, a whole based no longer on exclusion or homogeneity but on cultivating the uncontrollable; a whole that does not pretend to control beyond the range of a single perspective*".

65 Description of Brubeck Diagram. Source: http://www.team10online.org (15.08.2016).

66 Alison & Peter Smithson, *Ordinariness and Light: urban theories 1952-1960 and their application in a building project 1963-1970*, Faber & Faber, London, 1970.

67 *Ibidem*.

68 Alison Smithson, "How to recognize and read mat-building", *Architectural Design* nº 44, 1974, pp. 573–590.

69 Robert Venturi, *Complexity and Contradiction in Architecture,* The Museum of Modern Art, New York, 1996.

The approaches to *complexity* that have been mentioned above detach from the subject of the *complexity of the habitat for an extended multiplicity of users*, disregarding the challenge of articulation between the largeness and abstraction of the Big Building and the small detailed design of the dwelling unit, as well as all the implied 'in between' spaces, circulations, articulations and events. Multiple writings give emphasis to the topic of collective housing in terms of the complexity of relations between neighbours and the quality of the articulation spaces, in the same way that the interior planning of the dwellings and their spatial quality must remain as fundamental targets (Christian Moley 2005, 1999, 1979; Bernard Huet, Michèle Lambert & Jean-Yves Toussaint, 1990).

01
Complexity

Complexity

1.1. Complexity: general definitions

Complexity – the query of understanding its multiple volatile definitions – is the thread that binds our research together. Though the dictionary may suggest a rather simplistic and empirical definition that associates *complexity* to *complication* – "*the state or quality of being intricate or complicated*" or *"a factor involved in a complicated process*"[1] – as we plunge into the analysis of more thoughtful definitions as the ones expounded by sociologists, we are faced with an amplified detachment between the concept of *complexity* and the one of *complication*[2]. At a first look, both may be seen as intricate amalgamates of multiple superimposed elements, but whereas *complication* seems to relate to a haze of disorganized, unsorted and unlinked elements[3], *complexity* can actually be decomposed into a series of links, sequences and rules that reveal logics and synchronicity (e.g. the complexity of a living organism)[4]. The idea of **a system composed by the interconnection of multiple heterogeneous elements within an articulated whole** seems indeed to apply to the myriad of possible formulations that may embody and epitomize *complexity*.

Edgar Morin has leaped deeply on the quest for an understanding of the term, referring to the numerous possible forms of complexity within a comprehensive approach: *complexity as a fabric (complexus: what is woven together) of heterogeneous yet inseparably associated components reacting to actions, interactions, retroactions, determinations and hazards*[5]. Morin refers repeatedly to the paradox of *the one and*

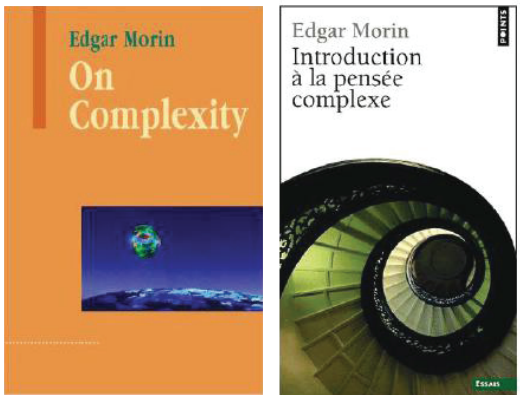
1 Definition of the term *Complexity* as per the Oxford Online Dictionary at http://www.oxforddictionaries.com.

2 Clemens Bellut wrote about the distiction between the 'complex' and the 'complicated', based on philosophical and literary concerns : « *Something complex can assume the appearance of simplicity, while the complicated always excludes everything simple from itself. (…) Complexity is not least the paradoxical striving to conceive of the incomprehensible* », Clemens Bellut, "Ach, Luise, Lass.... Das ist ein zu weites Feld or the Gordian Knot of Complexity", in Andrea Gleiniger, Georg Vrachliotis, *Complexity – Design Strategy and World View*, Birkhauser, Basel, 2008 (pp. 109-115).

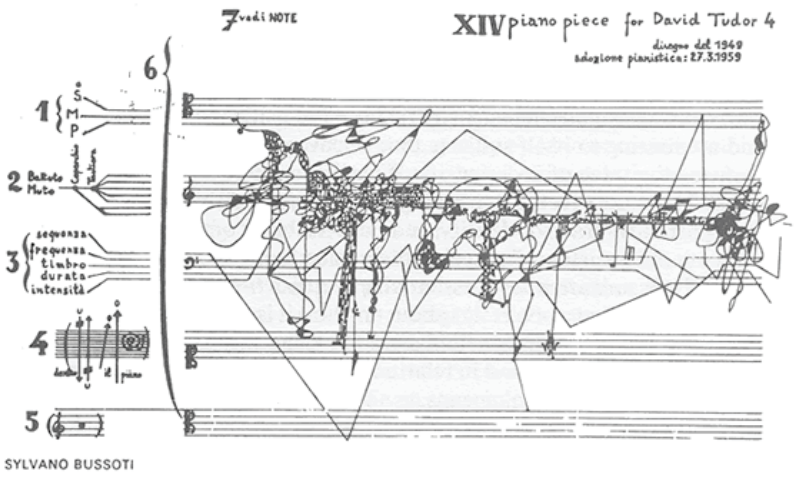
3 "*An involved or confused condition or state*" is the definition of the term *Complication* as per the Oxford Online Dictionary at http://www.oxforddictionaries.com.

4 This idea is emphasized by Johann Feichter: "*The astonishing thing about complexity is that it arises from the simplest phenomena. (…) Complexity arises from the numerous linkages and feedback loops between individual processes. This ' condition of interdependency' is the precise meaning of the Latin word* complexus." Johann Feichter, "Complexity and Climate", in Andrea Gleiniger, Georg Vrachliotis, *Complexity – Design Strategy and World View, op. cit.,* p. 99.

5 Translated from the French : « (…) *la complexité est effectivement le tissu d'événements, actions, interactions, rétroactions, déterminations, aléas, qui constituent notre monde phénoménal. Mais alors la complexité se présente avec les traits inquiétants du fouillis, de l'inextricable, du désordre, de l'ambiguïté, de l'incertitude...* », *in* Edgar Morin, *Introduction à la Pensée Complexe*, Seuil, Paris, 2005, p. 21; On the same subject, see Edgar Morin, « Le défi de la complexité », *Revue Chimère,* n° 5-6, 1988, p. 12 : "*Autrement dit, les complexités que j'ai évoquées (la complication, le désordre, la contradiction, la difficulté logique, les problèmes de l'organisation, etc.), tout ceci tisse la complexité : complexus, c'est ce qui est tissé ensemble ; c'est le tissu venu de fils différents et qui est devenu un. Autrement dit, tout cela s'entrecroise et s'entretisse pour former l'unité de la complexité ; mais l'unité du complexus ne détruit pas la variété et la diversité des complexités qui l'ont tissée.* » Edgar Morin, « Le défi de la complexité », *Revue Chimère,* n° 5-6, 1988, p. 12 ; see also Edgar Morin, « The Epistemology of complexity », in Dora Schnitman, *New paradigms, culture and subjectivity*, Hampton Press, Cresskill, N.J., 2002.



Book covers: Edgar Morin, ***On Complexity***, Hampton Press, NY, 2008
Edgar Morin, ***Introduction à la Pensée Complexe***, Seuil, Paris, 2005



The picture that accompanies the Introduction to the Rhizome
published in ***A Thousand Plateaus***, 1987.

the many[6], which implicitly recalls the concept of *rhizome*[7] - a philosophical theory explored by Félix Guattari and Gilles Deleuze in the 1970/80s, referring to the principles of multiplicity and mutualism, and to "*ceaselessly established connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles*"[8] [image]. Yet, Morin's query seems to go beyond the definition, and to actually seek for tools to help deciphering *complex thinking* in a wider sense: he suggests that complexity can be untangled through the *recognition of the irreducible elements*, followed by its *organization through hierarchy or through grid systems* that allow for placing contents together, identifying the links between the different elements and, ultimately, prompting the discovery of new patterns[9]. The approach suggested by Morin could apply to multiple different fields of knowledge and both to the analysis of physical/material elements and to social/immaterial ones.

In architecture, the general concept of *complexity* has been approached via several different perspectives throughout times, yet it is important to understand the specific segment of architecture that is targeted for each case. Upon closer investigation of how *complexity* can be approached in architecture, we have identified three fundamental stages:

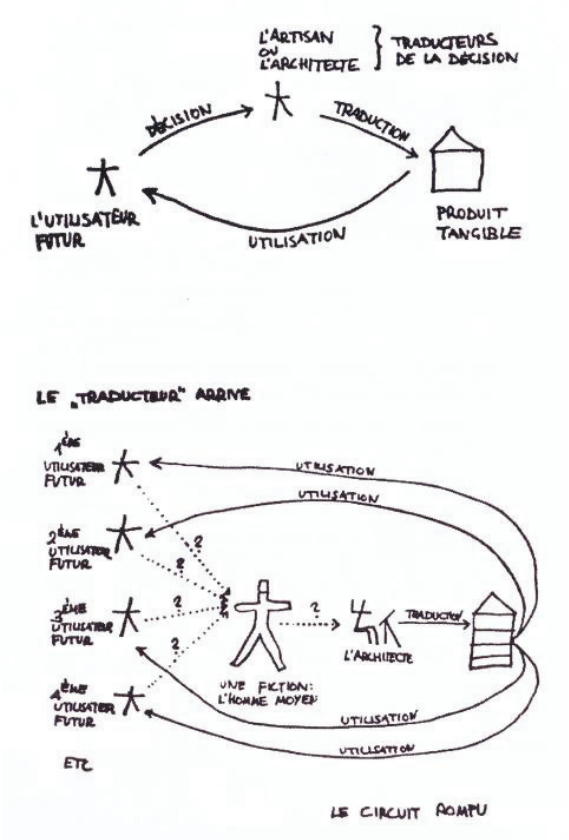
6 "(...) *vous allez joindre l'Un et le Multiple, vous allez les unir, mais l'Un ne se dissoudra pas dans le Multiple et le Multiple fera quand même partie de l'Un*", Edgar Morin, *Introduction à la Pensée Complexe*, Seuil, Paris, 2005, p. 104.

7 Deleuze and Guattari are the authors of a double-volume work called *Capitalism and Schizophrenia*: the first is entitled *Anti-Oedipus* (Gilles Deleuze, Félix Guattari, *Capitalisme et schizophrénie: L'Anti-Oedipe*, Les Editions de Minuit, Paris, 1972) and the second *A Thousand Plateaus* (Gilles Deleuze, Félix Guattari, *Capitalisme et schizophrénie: Mille Plateaux*, Éditions de Minuit, Paris, 1980). The creation of the *rhizome* – considered a ground-breaking methodology for thinking - is their masterpiece. Deleuze and Guattari proclaim that western thinking is structured like trees – evolving upward, towards some end goal of truth and knowledge, with responses and criticisms as branches. They labeled this the 'aborescent' scheme for conceiving knowledge. Arborescent approaches seek essences, unity, and binaries; the rhizome, on the other hand seeks multiplicities, diversities, and states of becoming. The *rhizome*, unlike the tree, expands horizontally, seeking to offer a linkage system for different ideas. Source: http://plato.stanford.edu/entries/deleuze/ (13.02.2016).

8 Gilles Deleuze & Felix Guattari, *A Thousand Plateaus*, University of Minnesota Press, Minneapolis 1987, p.7. (original French version: Gilles Deleuze, Félix Guattari, *Capitalisme et schizophrénie: Mille Plateaux*, *op. cit*.).

9 *"(...) l'organisation est ce que constitue un système à partir d'éléments différents ; elle constitue donc une unité en même temps qu'une multiplicité. La complexité logique de l'*unitos multiplex *nous demande de ne pas dissoudre le multiple dans l'un, ni l'un dans le multiple. Ce qui est intéressant, de plus, c'est qu'un système est en même temps plus et moins que ce que l'on pourrait appeler la somme de ses parties. Quelque chose de moins dans quel sens ? Eh bien, c'est que cette organisation fait subir des contraintes qui inhibent des potentialités qui sont dans chaque partie, ce qui s'opère en toutes organisations, y compris sociales où les contraintes juridiques, politiques, militaires et autres font qu'il y a beaucoup de nos potentialités qui sont inhibées ou réprimées. Mais, en même temps, le tout organisé est quelque chose de plus que la somme des parties parce qu'il fait surgir des qualités qui n'existeraient pas sans cette organisation ; ces qualités sont « émergentes », c'est-à-dire qu'elles sont constatables empiriquement, sans être déductibles logiquement ; ces qualités émergentes rétroagissent au niveau des parties et peuvent les stimuler à exprimer leurs potentialités.» in* Edgar Morin, « Le défi de la complexité », *Revue Chimère,*

op. cit.. See also Edgar Morin, *Introduction à la Pensée Complexe*, *op. cit.* p. 39-40: « *il s'agit non pas de déceler des analogies phénoménales, mais de trouver les principes d'organisation communs, les principes d'évolution, les caractères de leur diversification* ».



Yona Friedman, Image extracted from ***Pour une architecture scientifique,*** Paris, Belfond, 1971.

1) the *design conception* – the act of conceiving the architectural project and resolving the multiplicity of simultaneous aspirations or challenges related to form and function[10];
2) the actual *experience/perception* of the built object or the architectural/urban space itself.
3) the *process* – the procedural phase of architecture, involving the intervention of multiple parts that are external to architecture, but that end up determining the architectural design (e.g. political, economical and juridical forces);

In a first moment, *complexity* is indeed implicit in any architectural project for it is the outcome of an intricate process of conception – empirical, mental, evocative – and it is developed through the process of "*researching an original synthesis that is the integration of forms, motivations and needs*"[11] – a definition launched by Marco Vidotto while analysing to the work of Alison and Peter Smithson. Philippe Boudon, on his turn, reinforces the idea of an articulated system as suggested by Morin, applied both to the architectural practice and to the challenge of synthesizing space and function: "*Toutes sortes de liaisons de l'ordre de la dépendance entre les dimensions et des valeurs qui y sont attachés par le concepteur constituent l'objet architectural finalement conçu en système (le terme désignant simplement ici un ensemble d'éléments liés les uns aux autres)*"[12].

Yet, as noted by Alain Farel in *Architecture et Complexité*, the real subject of *complex thinking* may still require exploration in what relates to the pure design practice: "*Ce que l'on pourrait nommer pensée complexe n'a fourni jusqu'a présent très peu de théorisations et d'applications dans le champ de l'architecture proprement dit.*"[13] The search for a *scientific method*, able to regulate and control the architectural conception, seems to be one of the central purposes of his work, bearing inspiration on the methodological research of Christopher Alexander[14] or on the axiomatic explorations of Yona Friedman in *Pour une architecture scientifique*[15] - « *il s'agit pour lui d'utiliser les concepts des sciences les plus récentes (logique, théorie de l'information, cybernetique, théorie des graphes) alliés à des outils mathématiques, pour atteindre ses objectifs* »[16] [image].

10 On the subject of design complexity, see Alain Farel, *Architecture et complexité – le troisième labyrinthe*, Editions Parenthèses, Marseille, 2008; Greg Lynn, Animate Form, Princeton Architectural Press, New York, 1999; Peter Eisenman, "Visions Unfolding: Architecture in the Age of Electronic Media", *Domus* no. 734, January 1992 (pp. 20-24); John Frazer, *An Evolutionary Architecture*, Architectural Association, London, 1995.

11 Marco Vidotto, *Alison + Peter Smithson*, GG, Barcelona-México, 1997, p. 10.

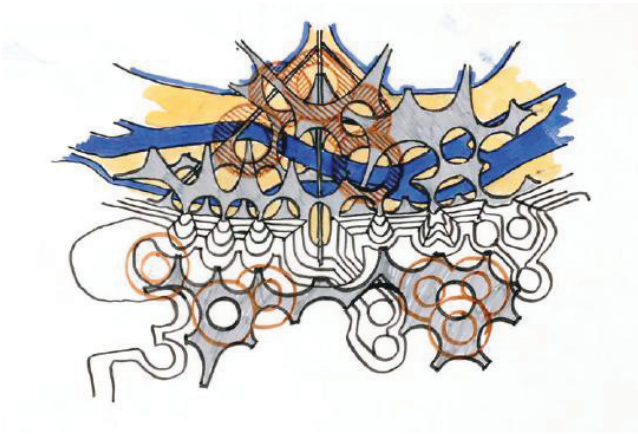
12 Philippe Boudon, *De l'architecture à l'épistémologie : la question de l'échelle*, Paris, Presses Universitaires de France, 1991, p. 180

13 Alain Farel, *Architecture et complexité – le troisième labyrinthe*, *op. cit.* (propos liminaire).

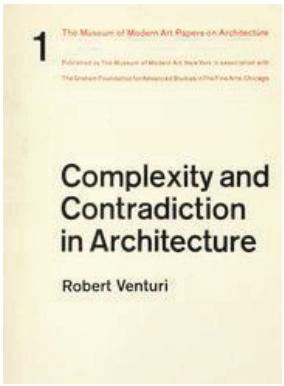
14 Christopher Alexander, *De la synthèse de la forme,* Dunod, Paris, 1971.

15 Yona Friedman, *Pour une architecture scientifique*, Paris, Belfond, 1971.

16 Alain Farel about the work of Yona Friedman, in Alain Farel, *Architecture et complexité – le troisième labyrinthe*, *op. cit.*, p. 70.



Renaudie Jean, Vaudreuil, 1967-1968 - Drawing 37.5 x 59 cm
Source: © François Lauginie - http://www.frac-centre.asso.fr



Robert Venturi, *Complexity and Contradiction in Architecture*, New York, 1966

Undertaking a different realm of architecture, a lot of what has been written on the subject of *complexity* was linked, in a large extent, to visual perception and, in particular, to the identification of a form of *ambiguity* in the visual field – *the semiotic complexity of the architectural form*[17]. Robert Venturi has initiated this discussion through the publication of *Complexity and Contradiction in architecture*, written under the form of a personal credo: "*I like complexity and contradiction in architecture – not the incoherence or arbitrariness of incompetent architecture, and not the precious intricacies of picturesqueness. I speak of a wider and solider matter: a kind of complexity and contradiction based on the need to consider richness of experience within the limitations of the medium.*"[18] Venturi's observations were focused on contradicting the 'sensorial deprivation' and lack of ambiguity of the realizations of modern architecture – the Modernist "*instrumental-rational objectification of design and planning that reduced the life complexity to a set of straight-forward rules*"[19]. Venturi proposed instead a perceptual input which was possible to be attained through complexity and ambiguity: "*I like forms that are impure rather than 'pure', compromising rather than 'clean', distorted rather than straightforward (…).*"[20]

Another explicit allusion to *architectural complexity* is the one of Aldo Van Eyck in the early 1960s, whose work and philosophy bear witness to a wish for the reintroduction of ambiguity and 'uncertainty' in architecture – the ambiguity of the 'in-between' spaces of architecture: *outside-inside, individual-collective, many-few*. The concept is present in his writing about the famous orphanage home project he has built in Amsterdam: "*Architecture should be conceived of as a configuration of intermediary places clearly defined… it implies a break away from the contemporary concept of spatial continuity and the tendency to erase articulation between spaces (between outside and inside, between one space and another). Instead the transition must be articulated by means of defined in-between places which induce simultaneous awareness of what is significant on either side*"[21].

The definition of *complexity* in architecture introduced in the 1970-80s by the French architect Jean Renaudie, whose architectural practice was deeply inspired on the architectural experiments of the Team 10, Paolo Soleri or the Japanese Metabolists, is also worth mentioning. Rejecting the schematism of the 'typical plan', Renaudie was nurtured by a definition of the term related to biological principles[22], seeking to offer 'architectural solutions' that eradicate the distinction

17 Andrea Gleiniger, Georg Vrachliotis, *Complexity – Design Strategy and World View*, *op. cit.,* p. 8.

18 Robert Venturi, *Complexity and Contradiction in Architecture*, New York, 1966, p. 22; Robert Venturi, "Complexity and Contradiction in Architecture", *The Yale Architectural Journal*, 1965, pp. 18-36. See also Denise Scott Brown, "Context and Complexity", in Andrea Gleiniger, Georg Vrachliotis, *Complexity – Design Strategy and World View*, *op. cit.* (pp. 24-34).

19 Andrea Gleiniger, Georg Vrachliotis, *Complexity – Design Strategy and World View*, *op.cit.,* p. 8;

20 Robert Venturi, *Complexity and Contradiction in Architecture*, *op. cit.,* p. 18

21 Aldo Van Eyck, *Architectural Design*, December 1962, p. 602

22 "*Renaudie a sans doute emprunté les termes de 'complexité' et de 'complexe' aux propôs tenus*

between architecture and urbanism, stating that every component makes sense only in its combination within a structure that is integrated itself in the depths of each element - a complexity produced through the imbrication. From the moment when Renaudie plays the 'organic metaphor', the terms 'complex structure' or 'complex organism' become repetitive, nearly compulsive[23]. Through the repetition and combination of geometric shapes, new and heterogeneous configurations of housing emerge, seeking to respond to human diversity and adapt to individual needs[24].

If the thought of the architect attains maturity in 1968, with his proposal for the new City of Vaudreuil (1967-1968)[25] [image], it will be mainly through his many projects of large ensembles - including downtown Ivry-sur-Seine (1970-1983) - all achieved almost in a single decade, which are real proof to the constructability and the complexity of Renaudie's 'architectural solutions'.

Amos Rapoport and Robert E. Kantor have highlighted the visions of the two architects mentioned above in an article entitled "Complexity and Ambiguity in Environmental Design", intersecting their thoughts with the works of reference authors from the fields of gestalt psychology[26]. The article focuses on questioning the hypothesis that "*humans prefer ambiguous, complex patterns in their visual fields*", proclaiming that "*an optimal range of perceptual input is desired*", rather than visual fields that are either too simple or too chaotic. Bernard Tschumi, on his turn, highlights the complexity inherent to the spatial experience itself: *"The complexity of architecture begins with the impossibility of questioning the nature of space and at the same time making or experiencing a real space. (…) We cannot both experience and think what we experience"*[27]

lors de la reencontre entre Jakobson, Lévi-Strauss, L'Héritier, Jacob.", *in* Bénédicte Chaljub, *Les oeuvres des architectes Jean Renaudie et Renee Gailhoustet 1958-1998, Théorie et pratique*, Phd Thesis, Université Paris VIII – Vincennes – Saint-Denis, 2007, p. 119.

23 *Ibidem*, p. 121.

24 See *La logique de la Complexité, Jean Renaudie*, ed. by Patrice Goulet, Nina Schuch, Carte Segrete, Rome, 2009.

25 *« A notre connaissance, Renaudie est le premier à mettre la 'complexité' au rang de 'concept' dans le champ architectural. C'est seulement à partir du Vaudreuil que Renaudie introduit l'idée de 'complexité'; son importance est soulignée par le nombre de fois où l'adjectif 'complexe' est utilisé, beaucoup plus que 'structure' ou 'combinatoire'. Le caractère 'complexe', réapparaissant dans les lignes de tous les textes, semble obsessionnel; l'architecte lui-même. L'adjectif est compris dans de nombreuses expressions répétées, devenant des slogans, des devises. » in* Bénédicte Chaljub, *Les oeuvres des architectes Jean Renaudie et Renee Gailhoustet 1958-1998, Théorie et pratique*, op. cit., p. 119.

26 Amos Rapoport , Robert E. Kantor, "Complexity and ambiguity in environmental design", *Journal of the American Institute of Planners*, 1967. The authors have sustained their hypothesis on the work of authors such as Ehrenzeig, Empson or Arnheim: "*Ehrenzeig related the human need for ambiguous, open-ended situation to many of the arts, and even Arnheim, a gestalt psychologist stressing closure as an aesthetic virtue, speaks of the "indispensable need for a minimum of complexity*" p. 210.

27 Bernard Tschumi: "Responding to the question of complexity", *Complexity, Art, Architecture, Philosophy - Journal of Philosophy and the Visual Arts*, no. 6, ed. By Andrew Benjamin, London, 1995, p. 82.

Without disregarding the pertinence of the multiple forms of complexity mentioned above, we must stress here that our fundamental research on the theme of *architectural complexity* will remain focused on the forms of complexity that relate more directly to the analysis and understanding of our study object: the Big Building. The first one is the complexity related to the challenge of conceiving a new peculiar form of *urbanism* within an *architectural object*; as an *architectural/urban model,* the Big Building goes beyond this basic idea of complexity implicit in the architectural conception and it implies the use of design strategies that go beyond the classic architectural premises, extending to some principles and strategies of urbanism. The second one tackles the complexity of the process that enables such ambitious schemes to become reality; the stakeholders are much larger in number, different in fields (architecture, urbanism, sustainability, business strategy, finance, law) and very atypical in terms of decision supremacy, a fact that generally weakens the design and the autonomy of the architects.

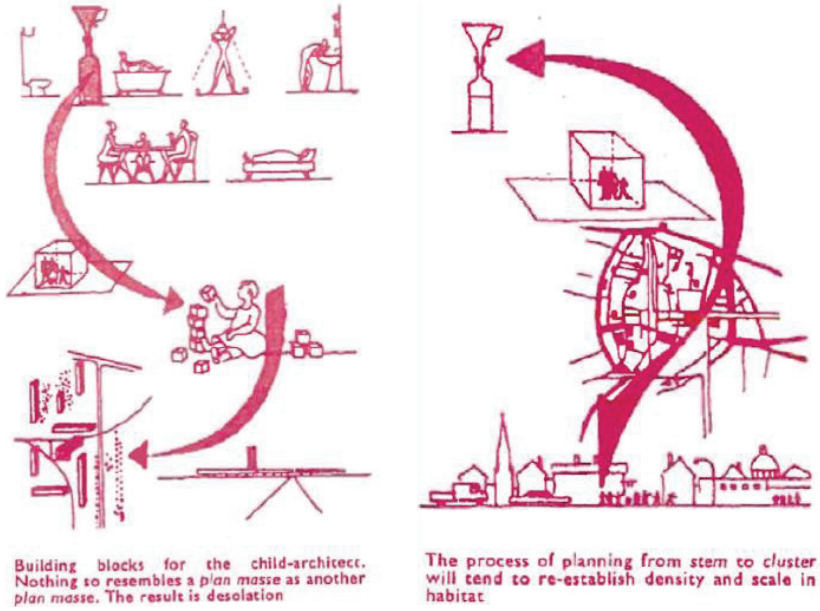
In this sense, we will center our research in two historical moments that may add valuable inputs to our study of the Big Building, in light of the above-mentioned realms.

The first moment dates from the 1950-60s and is led by Alison & Peter Smithson and the Team X. It arises with the aim of reintroducing a humanistic form of architectural/urban complexity in architecture, in opposition to the modernist models of large scale and the segregationist principles of the *Charte d 'Athènes*. This *desirable complexity* is linked to the revival of key elements of the city and the restoration of the relational complexity implicit in the traditional urban fabric – this approach focuses on transposing into the design of residential buildings (which tended to follow an orthogonal hygienist logic) the relational complexity of urban areas, especially the one of the street.

The second moment dates from the 1990s, it is headed by Rem Koolhaas, and it refers to the rupture of scale – Bigness – as a starting point for a new type of architecture – one that is so complex in its formulation that a single architect can no longer resolve it. Koolhaas focuses more on the process (and its multiple divergent actors) than on the defiant design challenge which is that of conceiving and designing complexity within a building of exceptional scale - and still manage to articulate it with its context. Moreover, Koolhaas refers to Bigness as a building model that exists on its own and that hardly relates to the city.

Throughout the next pages, we will understand that spatial/programmatic complexity and the complexity of the process do not always evolve alongside and do not necessarily correlate – they can even be contradictory and, in some cases, undermine one another.

Finally, we will raise the hypothesis that, despite its inherent complexity, the design conception of the Big Building can still aim to be developed within the premises of a humanistic approach – articulating with the scale of the city, dwelling and individual – while dealing with the weaving and divergent forces implied in the overall process.



'Child Architect' Diagram, Shadrach Woods, 1960
Source: Shadrach Woods «Stem», *Architectural Design*, vol. 5, 1960.

1.2. Relational Complexity

1.2.1. The complexity of the habitat for a real and uncertain individual: a changeable and unpredictable entity: the approach of Alison and Peter Smithson and the Team 10

In the second half of the twentieth century, a tough critique has been raised against Modernism, lasting for the three decades that followed. The functional urbanism - seen as purely technical and inhuman - was said to have overlooked the importance of social exchanges and, ultimately, to have become unable to adapt to the rapidly evolving social and economical new dynamics of the cities.

As a consequence, between the post-war and the post-modernism, a group of young architects - who had congregated during the final meetings of the CIAM under the name *Team 10*[1] - started seeking for a revival of the sense of unity of the urban community, aiming for the establishment of a *new vitality* and a new *humane dimension* in the cities, driven by cultural, anthropological and sociological values[2] - "*they sought to replace the concept of the Functional City with their proposal for an approach to town planning based on 'human association'*."[3] Their approach is well illustrated in Shadrach Woods's 'Child Architect' Diagram from 1960 [image].

This particular form of architectural complexity, raised in opposition to the functional segregation proclaimed by the *Charte d'Athènes*[4], has been explored by different groups of architects around the world - initiators of new *movements* - bearing a particularly frivolous spirit, during the period between early 1950s and early 1970s[5].

The query of *housing and habitat* was the center of the architectural conception and debate at the time, mostly as a consequence of the urgent housing needs during the post war period. Though the theme of *the home* is, as stated by Beatriz Colomina the quintessential architectural theme of the entire twentieth century: "*the history of*

1 Team 10 was a group of architects with varying members since its first assembly in July 1953 at the 9th Congress of C.I.A.M. The seven most active and longest-involved participants in the Team 10 discourse were Jaap Bakema, Georges Candilis, Giancarlo De Carlo, Aldo van Eyck, Shadrach Woods and Alison and Peter Smithson. Other members worth mentioning are José Coderch, Ralph Erskine, Amancio Guedes, Rolf Gutmann, Geir Grung, Oskar Hansen, Charles Polonyi, Brian Richards, Jerzy Soltan, Oswald Mathias Ungers, John Voelcker and Stefan Wewerka; but even this list can in no way be considered complete, considering the broad context of Team 10. Source: http://www.team10online.org (20/02/2016)

2 The founding manifesto of the Team 10 - the *Doorn Manifesto* (or 'Statement on Habitat') written in January 1954 by the young members of the CIAM who fiercely denounced urban planning developed according to the precepts of the Charter of Athens and asserted their determination to "*reformulate the goals of urban planning*" - Extract of the first version of the manifesto, untitled 'CIAM meeting, 28-31 janvier 1954, Doorn. Statement on Habitat' and signed by Bakema, Van Eyck, Van Ginkel, Hovens Green, Smithson and Voelker, published by *Forum* (n°7, 1959). The *Doorn Manifesto* is available online at http://www.team10online.org (20/02/2016).

3 Dirk van den Heuvel, *Alison & Peter Smithson - A Brutalist History involving the house, the city and the everyday (plus a couple of other things)*, dissertation, Technische Universiteit Delft, May 2013.

4 Consolidated in the fourth CIAM conference in 1933 in Athens, the planning strategy of the *Charte d'Athènes* consisted on a rational analysis of the different functions of the city and on their organisation into separate different sectors within the city.

5 In the book *Superarchitecture*, Dominique Rouillard refers to two important dates that correspond to a period of a 'particularly frivolous architectural thinking': "*1950-1970: la période accélère la fin de la modernité, et lui substitue discrètement la situation contemporaine*", Dominique Rouillard, *Superarchitecture*, Éditions de la Villette, Paris, 2004.

THE DOORN MANIFESTO

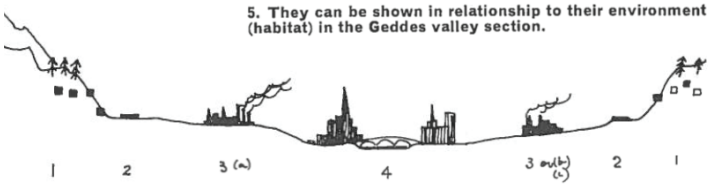
1. It is useless to consider the house except as a part of a community owing to the inter-action of these on each other.

2. We should not waste our time codifying the elements of the house until the other relationship has been crystallized.

3. 'Habitat' is concerned with the particular house in the particular type of community.

4. Communities are the same everywhere.
(1) Detached house—farm.
(2) Village.
(3) Towns of various sorts (industrial/admin./special).
(4) Cities (multi-functional).

5. They can be shown in relationship to their environment (habitat) in the Geddes valley section.



6. Any community must be internally convenient—have ease of circulation; in consequence, whatever type of transport is available, density must increase as population increases, i.e. (1) is least dense, (4) is most dense.

7. We must therefore study the dwelling and the groupings that are necessary to produce convenient communities at various points on the valley section.

8. The appropriateness of any solution may lie in the field of architectural invention rather than social anthropology.
Holland, 1954

The Doorn Manifesto

Source: Alison Smithson (ed.), ***Team 10 primer***, Published by The M.I.T. Press, London,1974, p. 75.

the architecture of the [twentieth] century is the history of the search for a house"[6] – it was only from the 1950s that the query of *habitat* has been interwoven with the query of *urbanism and the city*, whose treatment and conception has started to be explored with a higher level of complexity. If on the one hand there was a nostalgic fascination with the vernacular *street&house system*, - which tended to fade in a scenario of urban densification - such fascination has been followed by the observation that collective housing buildings were becoming increasingly standardized, impersonal and inhuman.

However, the truth is that the 1950s and 1960s have been at the origin of a double architectural heritage. On one hand, the massive and intensive construction of the *Trente Glorieuses* was attaining an enormous vigor in the architectural production. The construction of multiple housing buildings - known in France as *Grands Ensembles* – seemed to epitomize part of the Utopia proclaimed by Modernism, and to trigger the proliferation of the so called "*monuments of periphery*" [7]. These large housing constructions, because of their size, quantity and extension through the territory, had indeed become a symbol of the European growth after the war.

On the other hand, though, there was the beginning of an architectural upheaval: the renewal of the modern architectural precepts by the hands of the young architects who have brilliantly and extensively produced theoretical reflections, graphical schemes, manifests and projects to criticize and provide alternatives to the modern movement and its abstract rationalism. As highlighted by Dominique Rouillard, during these twenty years – early 1950s to early 1970s - many efforts have been done in the sense of recreating architecture. These *movements* did not only react about the modern precepts, they reacted against one another: a) the Team 10 - proposing a realist and social approach; b) the pseudo-utopia visions of the megastructures at the end of the 1960s; c) the Critical/Radical Utopias – a negative criticism that consolidated the "end" of the Modern Movement[8].

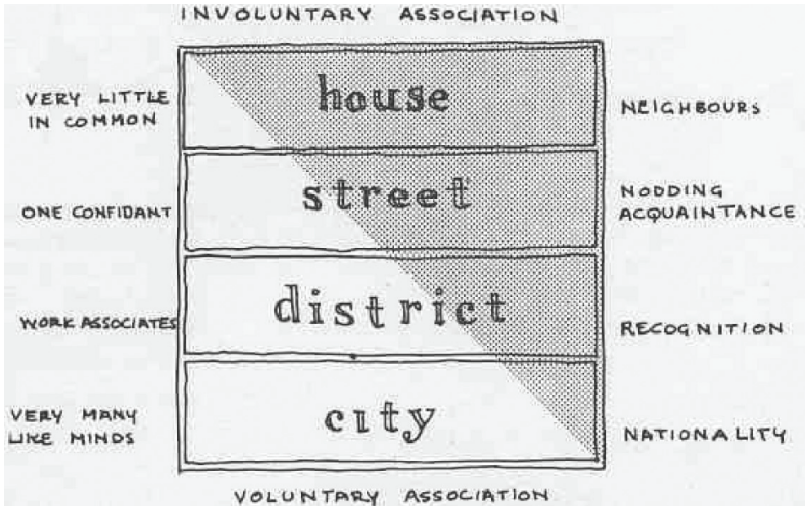
Alison Smithson and Peter Smithson & the Team 10 have taken the first lead over the reintroduction of the idea of *relational complexity* in the architectural conception, linking it to the creation of a scene where social interactions could freely proliferate. They have departed from a critical reaction against the simplistic functional segregation of the *Charte d'Athènes*, and developed multiple strategies - the *stem*, the *cluster*, the *mat building* - that epitomized the reintroduction of a sense of *relational complexity* in the architectural theory and practice. The reintroduction of urban elements and complex social connections, coexistences and articulations within the planning of buildings were counted amongst their innovations. Yet, more than in built projects, the relevance and the topicality of the legacy and the thinking of Alison and Peter Smithson are to be found in "*the intelligence and the anti-rhetorical charm of a research that used innovative design tools articulated with sharp written articles*"[9].

6 Beatriz Colomina, "Couplings", in *OASE*, n° 51 *(*Re-arrangements. A Smithson Celebration*)*, June 1999, pp. 20-33.

7 See Bernard Huet, « Les méga-structures en ligne », *L'Architecture d'Aujourd'hui*, n° 183, 1976 and « L'architecture contre la ville », *AMC*, n°14, 1986.

8 Dominique Rouillard, *Superarchitecture*, *op. cit.,* pp. 11-16.

9 Marco Vidotto, *Alison & Peter Smithson (Obras y Proyectos / Works and Projects),*



Alison & Peter Smithson, Urban Structuring scheme

Source: Alison & Peter Smithson, *Urban Structuring - Studies of Alison & Peter Smithson*, Studio Vista, London, 1967.

1.2.2. The *House* and the *Street*

"*There should be a basic programme for the dwelling in terms of the activities of the family, considering them separately and in association with each other. (THE HOUSE).*"

"*We should then consider the first point of contact outside the dwelling where children learn for the first time of the world outside the home and where are carried on those adult activities which are essential to everyday life, for instance, shopping, making minor repairs, posting letters, cleaning the care, or exercising the dog. (THE STREET).*"[10]

The CIAM IX, held in Aix en Provence in 1953, has been the stage for two opposed architectural lines of thinking. Under the theme *La Charte d'Habitat* - proposed by Le Corbusier as a form of continuity with the *Charte d'Athènes* - radically different projects and forms of presentation have been exposed, grouped in two fundamental trends. On one side, a direct continuity with Modernism could be recognized in proposals of *Grands Ensembles* (for instance, Marcel Lods's project for *Grands Terres de Marly* –1500 affordable dwellings for 6000 inhabitants, in line with the general strategy for reconstruction of a post war Europe)[11]. On the other side, though, something completely different and radical: the proposal presented by Alison and Peter Smithson represented an implicit and yet remarkable criticism to the abstract individual of modernism, illustrated in the 'Grid of urban re-identification' [image on the next page]. The concept has been exposed in a grid, half of it occupied with photos of children playing at 'the street'[12]. In the same event where Le Corbusier exposed his perspectives of pilotis buildings, the Smithsons chose a current state (the child, the street), and their presentation suggested a focus on the individual, culturally and socially real - an intent that was shared with Georges Candilis, Alexis Josic and Shadrach Woods. Suddenly, the terms *house, street, relationship* that had been neglected by the Modern vocabulary, have been brought back to scene as pieces of a promising new movement through this '*grid of urban re-identification*'. The *abstract*, the *looseness*, the *hazard* and the *complexity* were the fundamental terms implicit in the 'Grid of urban re-identification' and also the key values that one would wish to see again in the architectural production. The children, the 'forgotten entities' of the modernist architecture, suddenly became the protagonists.

From their early works, the Smithsons proposed new objectives and models for the organization of the large collective housing building, extending them to the conception of the urban fabric: "*One of the Smithsons' most important contributions to the debate on mass housing and urban planning is their focus on the idea of the street as a social space*".[13]

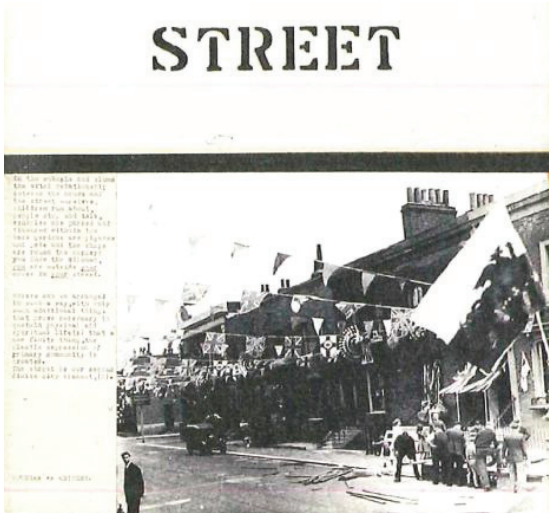
Paperback, March, 1997.

10 Alison Smithson, *The Emergence of Team 10 out of C.I.A.M.*, London: The Architectural Association, 1982, pp. 8-9.

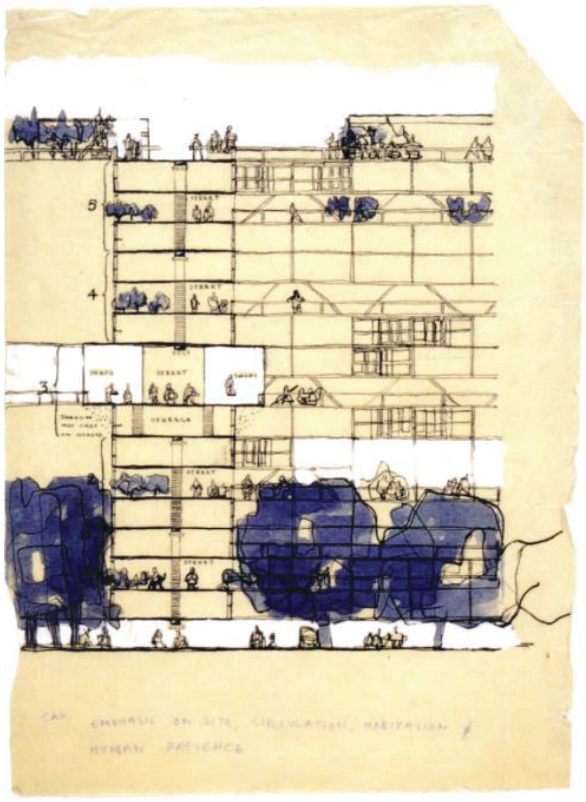
11 See Catherine Blain, "Team 10, the French Context", in Tom Avermaete, *Team 10 : between modernity and the everyday,* Delft University, Delft, 2003.

12 The photographs taken by Nigel Henderson in 1951 show the reality of the Bethnal Green community in London. The photographer's wife, the anthropologist Judith Henderson, has also studied this area.

13 Dirk van den Heuvel, *Alison and Peter Smithson: From the House of the Future to a House of Today*, 010 Publishers, London, 2004, p. 60.



Extract from Alison & Peter Smithson, ***Grid of the Urban Re-identification***, presented at CIAM IX, 1953.



Golden Lane: Sketch of section showing streets-in-the-air: Peter Smithson, 1953

Source: Dirk van den Heuvel, Alison Margaret Smithson, Max Risselada, Peter Smithson, Beatriz Colomina, Alison and Peter Smithson: *From the House of the Future to a House of Today*, Design Museum, London, England, 2004.

If indeed the subjects of *inhabitation*, *the house* and *housing* were the core subjects of the Smithsons' theories, the 'doorstep philosophy' reveals that the city has also assumed a significant predominance in their work, as the dwelling relates simultaneously to the inside and the outward space: "*The house, the shell which fits man's back, looks inward to family and outward to society and its organization should reflect this duality of orientation. The looseness of organization and ease of communication essential to the largest community should be present in this, the smallest.*" [14]

Contrasting with the Le Corbusier's early statements exposed in the article "La Rue" in 1929[15] - which contained a tough critique against the traditional 'corridor street', described as being only a channel, a tight passageway, a deep fissure - the traditional street is, for the British couple, the fundamental and most powerful element that guarantees *connection* and *encounter*: the solidifying backbone of the collective living. They nurture a particular interest in the 'street of the slum', 'the street of the poor', that space proper for social encounters, the place where popular lifestyles have a particular charm[16]. A model of *revival* is ultimately created: the street is the space for sociability of the people who can't stay at home; where the children play when the house is too small[17].

The street was also the one element that could be extracted from the vernacular - the 'slum' - to then be grafted into the densified forms of collective living: the street as the place for the proliferation of events and human interaction. And it is exactly the word 'street' - the ideology rather than the form - that is at the base of the multiple expressions ultimately invented by the Smithsons: *street-mesh-in-the-air, building-as-street, street-deck*, etc[18].

In the streets, the organic interrelation between the house and the public space/ street seems to endure; the kids run freely, adults walk, stop and chat, in the back garden there are pigeons, pets, and the small commerce it at the corner of the street. The *street of the slum* is like a medieval street - the only one capable of solidifying and defining a community[19].

At the CIAM 1953 Congress, the Smithsons wrote: "*Belonging is a basic emotional need - its associations are of the simplest order. From 'belonging'-identity - comes the enriching sense of neighborliness. The short narrow street of the slum succeeds where spacious redevelopment frequently fails.*"[20]

14 Alison and Peter Smithson, *Ordinariness and Light. Urban Theories 1952-1960 and their Application in a Building Project 1963-1970*, MIT Press, Cambridge MA, 1970, p. 44.

15 Le Corbusier, "La Rue," *L'Intransigeant*, May 1929; republished in Le Corbusier, *Le Corbusier et Pierre Jeanneret: Oeuvre complete de 1910-1929*, Zurich, 1937, (pp. 112-115).

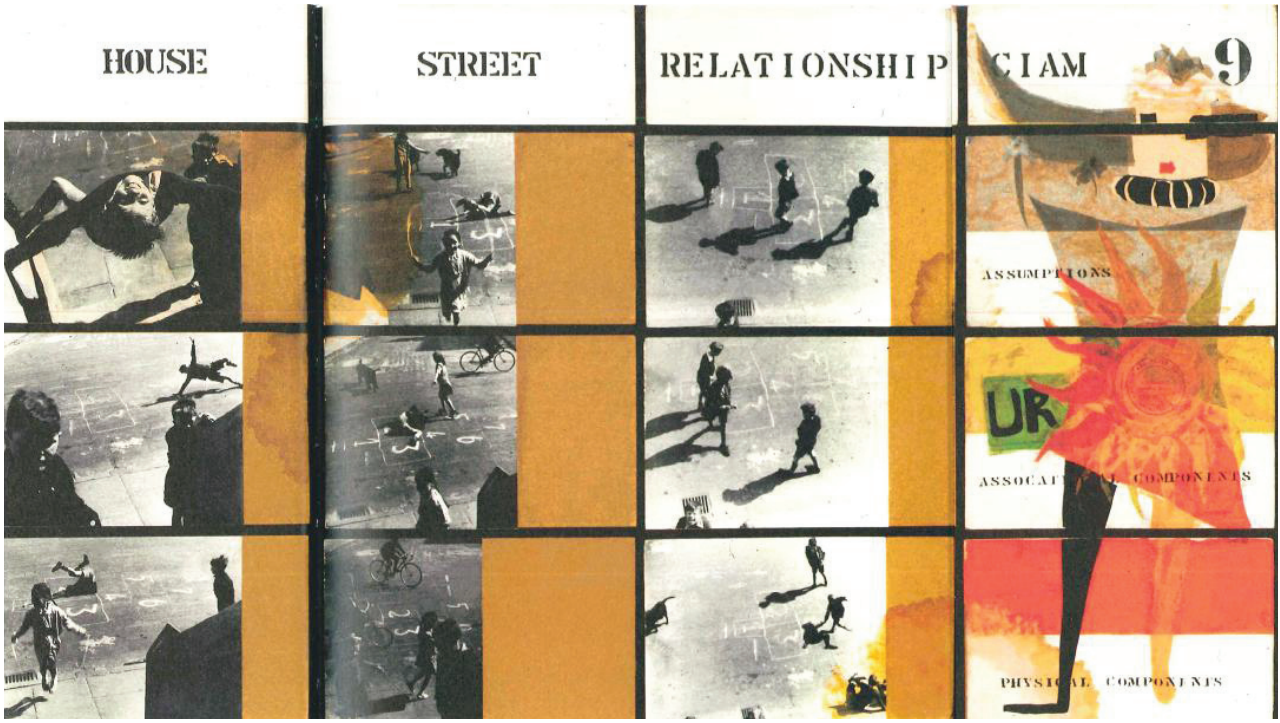
16 Dominique Rouillard, *Superarchitecture Le futur de l'architecture 1950-1970*, *op. cit.*, p. 26.

17 In *Ordinariness and Light*, the Smithsons write: *"The "street" is an extension of the house; in it children learn for the first time of the world outside the family; it is a microcosmic world in which the street games change with the seasons and the hours are reflected in the cycle of street activity."* *op. cit.*, p. 45

18 See Dominique Rouillard, *Superarchitecture Le futur de l'architecture 1950-1970*, *op. cit.,* p. 26.

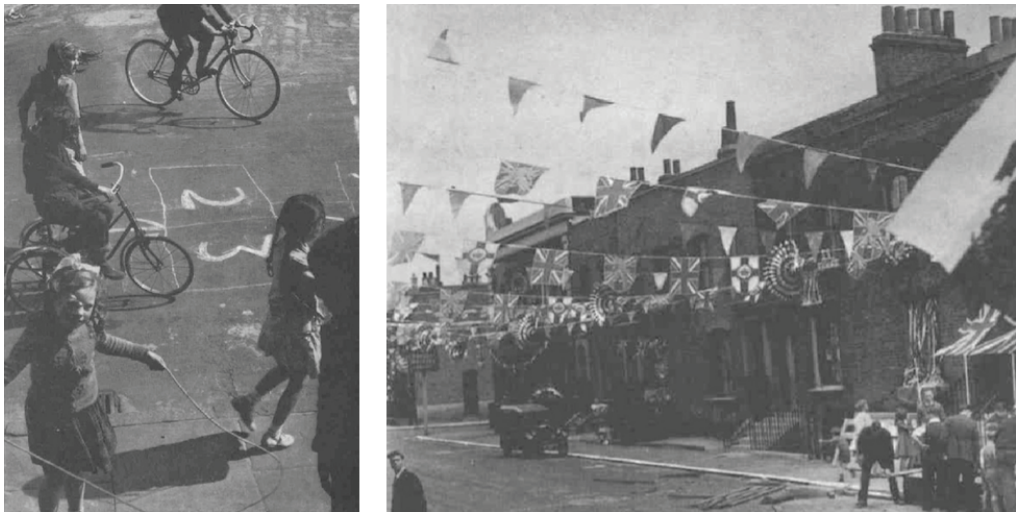
19 *Ibidem.* p. 26 (translated from the French).

20 Peter Smithson at the *Congres Internationaux d'Architecture Moderne in Aix-en-*



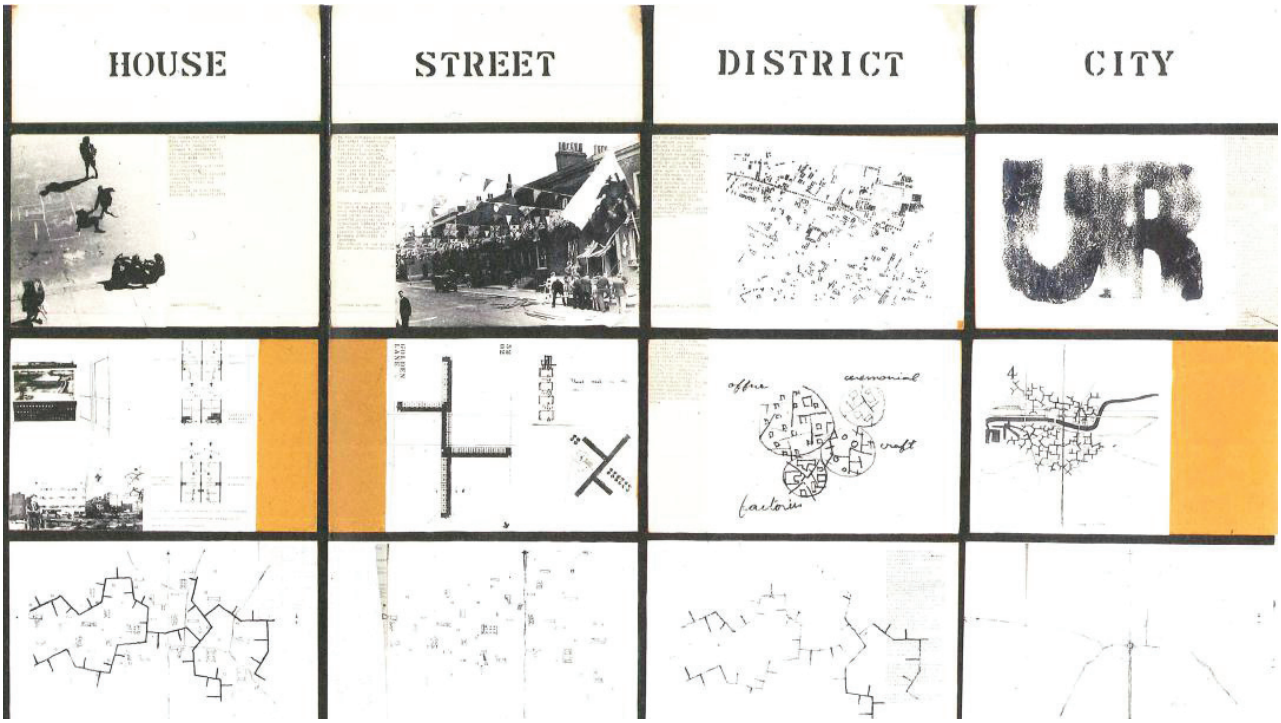
Alison & Peter Smithson, ***Grid of the Urban Re-identification***, presented at CIAM IX, 1953.

Source: Dirk van den Heuvel, Alison Margaret Smithson, Max Risselada, Peter Smithson, Beatriz Colomina, Alison and Peter Smithson: *From the House of the Future to a House of Today*, Design Museum, London, England, 2004.



Nigel Henderson, ***Patterns of association identity***

Source: Dirk van den Heuvel, Alison Margaret Smithson, Max Risselada, Peter Smithson, Beatriz Colomina, Alison and Peter Smithson: *From the House of the Future to a House of Today*, Design Museum, London, England, 2004.


HOUSE
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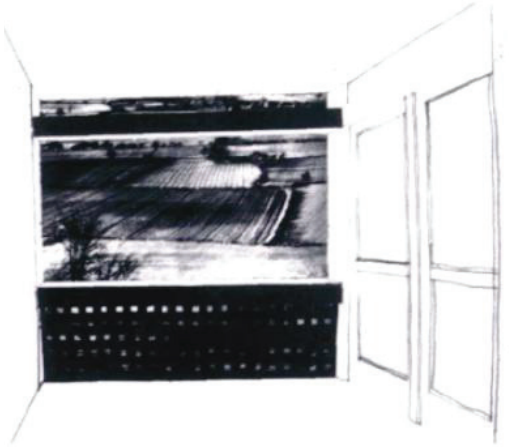
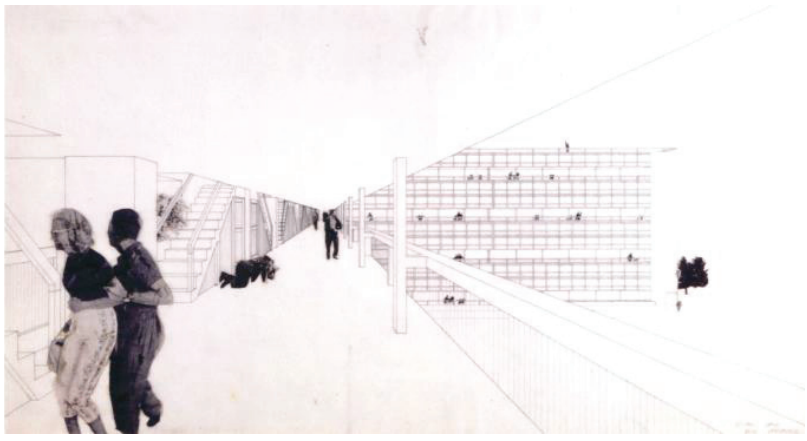
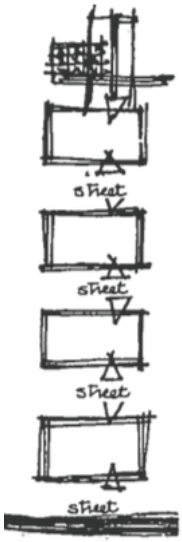


Golden Lane: Photomontage of Yard Garden adjacent to garden room; Alison Smithson, 1952.
Source: Alison Smithson (ed.), *Team 10 primer*, Published by The M.I.T. Press, London, 1974.



Photomontage of Golden Lane project: street deck with Marilyn Monroe and Joe DiMaggio in foreground; Peter Smithson, 1953
Source: Dirk van den Heuvel, Alison Margaret Smithson, Max Risselada, Peter Smithson, Beatriz Colomina, Alison and Peter Smithson: *From the House of the Future to a House of Today*, Design Museum, London, England, 2004.



"Street mesh in the air", basic diagram, Peter Smithson, 1951

The Golden Lane project, developed in 1952, was the first project where the Smithsons embedded their thoughts on '*the street and the house*' [image]. The project, a high-rise housing building with the form of a 'snake' containing broad *'streets in the air*' epitomized a first attempt to 'humanize' the Modern urban theory. It was "*a multi-level project with housing occupying one side of the building with wide 'streets in the air', designed to provide residents with direct pedestrian access to activities intended to give the community 'a strong sense of identity'*"[21]. After all, "*it was only through (re)conceptualizing such interconnections between housing and city that building production, housing design and the living environment of the working and lower middle classes could be drastically improved*."[22]

In that sense, the layout of the *deck* [image] - the 'street-in-the-air' - and the yards are said to obey to the standards of domestic living: "*These yard-gardens, which can be seen from the deck, bring the out-of-doors life of a normal house – gardening, bicycle cleaning, joinery, pigeons, children's play, etc., on to the deck, identifying the families with their "house" on their deck. The arrangements at deck level are "detached", "semi-detached" or "terraced" (each deck differs). The piece of the dwelling at deck level is small and unintimidating to the playing child, and the passing stranger's view is enriched by glimpses, through the open yard-gardens, of the city and river*."[23]

1.2.3. The complexity of the connections - "the Flux"

The initial sketches of the Golden Lane project show an elementary broken line - a segment for the movement, a circle for the stop [image] - linking different points, representing the behavior of an inhabitant, his movements - strolls, stops, intervals, exchanges - as an effort towards the understanding of a certain place through the movements of its inhabitants. The stops are points of bifurcation on the 'rhizome' of reorientation, places to meet in front of elevators, the garbage collector, the small shops, the parking entries - all things that happen when two flows (of people) get to intersect, and that the Smithsons aimed to reconstruct within the street-bridges of their buildings[24].

"*What we are after is something more complex, and less geometric. We are more concerned with 'flow' than with 'measure'*"[25], they said. The different diagrams produced to expose the idea behind the Golden Lane reveal the principle of

Provence, France, 1953 (via " Dharavi: Documenting Informalities" 2008, p. 25).

21 '*Streets-in-the-air*' is an expression employed by Alison and Peter Smithson, to illustrate the design strategy that has been used at the Golden Lane project. It refers to a series of lifted pathways – also designated as 'deck' – that did the distribution to each housing unit.

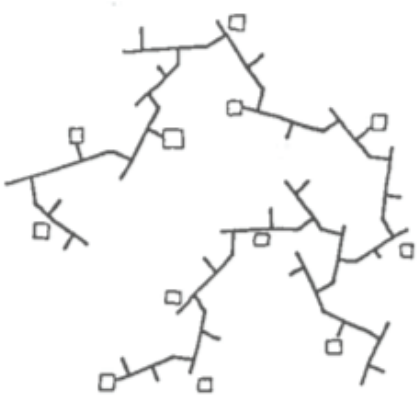
22 Dirk van den Heuvel, *Alison & Peter Smithson - A Brutalist History involving the house, the city and the everyday (plus a couple of other things), op. cit.*, p.83.

23 Alison and Peter Smithson, *Ordinariness and Light*, *op. cit.*, p. 56.

24 Dominique Rouillard, "La théorie du Cluster: généalogie d'une métaphore", in Bruno Fayote Lussac et Rémi Papillault *Le Team Ten et le logement collectif à grande échelle en Europe*, Maison des Sciences de l'Homme de lAquitaine, Toulouse, 2004 (pp. 78-79).

25 Alison & Peter Smithson, *Urban Structuring – Studies of Alison & Peter Smithson*, Studio Vista, London, 1967.

A&P. Smithson, Multi level residential streets linked to offices - Diagram, 1954.



A&P. Smithson, Diagram of Appreciated Unit, 1954.

Source: Dirk van den Heuvel, Alison Margaret Smithson, Max Risselada, Peter Smithson, Beatriz Colomina, Alison and Peter Smithson: *From the House of the Future to a House of Today*, Design Museum, London, England, 2004.

proliferation of the system, from a succession of lines linking dispersed points[26] [image]. Indeed, the idea behind the project went beyond the conception of the Golden Lane, intending to contaminate and inspire a series of other projects[27] and also to enhance the importance of recreating the quality and the complexity of the urban space within large-scale models of densification.

These first diagrams show that the increase and expansion of a 'street-building' are thought as a circulation network: streets are sometimes absent in the representation, leaving to the buildings the role of representing the flux. The diagram 'The City' introduces the city as a superposition of two different networks (bridge buildings and circulation paths), to which public services connect. Within this subject, they have also produced the diagram entitled "*'hierarchy of association' - ranging from 'voluntary' to 'involuntary association' and from 'house' via 'street' and 'district' to 'city'*".[28]

"*Connection*" becomes a fundamental term – the core theme on the work of the Smithsons and the Team 10, as much as the representation of action and movements becomes more important than the features of architecture itself – one could call it a sort of "annulation of architecture".

1.2.4. The Cluster

Aside with the idea of *flux* and *connection*, most of the projects conceived by Alison and Peter Smithson translate a theory of urbanism made of "points of intensity" and "intervals" in between the major 'events' of an urban structure. This theory is translated by means of several diagrams, in which the *points* represent particular services and are susceptible to change.

Cluster [29] was the term appropriated by the architects in the 1950s, seeking to illustrate this sort of urbanism that was "more complex and less geometric" than the modern urbanism and the schemes proposed by Le Corbusier; the cluster embodied the idea of "*a close knit, complicated, often moving aggregation, but an aggregation with a new distinct structure. This is perhaps as close as one can get to a description of the new ideal in architecture and town planning*"[30].

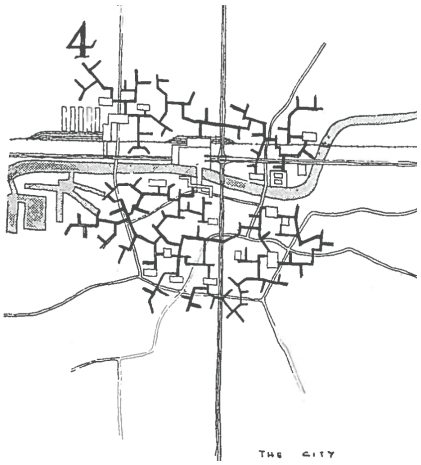
26 Alison & Peter Smithson, *The Charged Void: Architecture*, New York, Monacelli Press, 2001, p.88: "*The idea elaborated into a city fabric"; "Connective Urban form*".

27 In 1961, this plan inspired Sheffield city council's Park Hill Estate. The Smithsons themselves built Robin Hood Gardens in 1972, but by then the wider deficiencies of Modernism were becoming apparent to the general public as well.

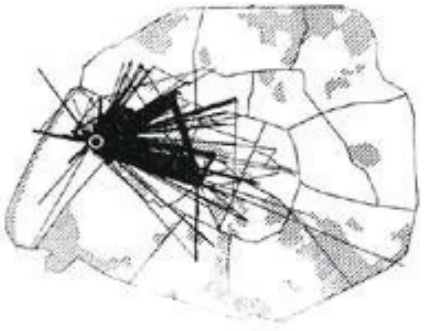
28 Published in Alison Smithson (ed.), *The Emergence of Team 10 out of C.I.A.M.*, 1982, pp. 8-9; much of this argument is republished in various Smithson publications such as *Upper Case, Urban Structuring* and in *Ordinariness and Light*.

29 Dominique Rouillard explains the origin of the appropriation of the term 'Cluster' by the Smithsons: "*Aussi les Smithson s'enthousiasment-ils pour le terme de cluster ("grappe") apporté par Denys Lasdun (via les analyses de Kevin Lych) et par l'écoute de Victor Gruen (...)*". Dominique Rouillard, *Superarchitecture Le futur de l'architecture 1950-1970*, *op. cit.*, p. 45.

30 Alison and Peter Smithson, *Ordinariness and Light*, *op. cit,* p. 131.

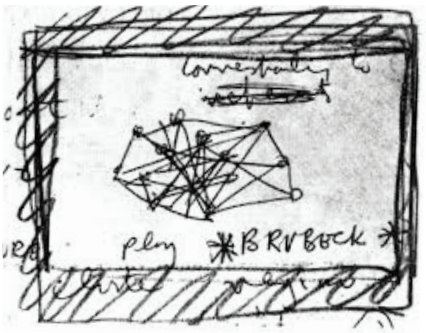


First ***Cluster City*** Diagram P. S. 1952



P. H Chombart de Lauwe, Théorie de la dérive: «*schéma des trajets d'une étudiante dans le 16e arrondissement de Paris, 1952*»

Source: *Internationale situationiste,* February 1958.



The sketch 'Play Brubeck' by Peter Smithson for Team 10. It was published in Team 10 Primer with the following caption: "Ideogram of net of human relations. P.D.S. A constellation with different values of different parts in an immensely complicated web crossing and recrossing. ***Brubeck! a pattern can emerge.***"

Source: image published in Alison & Peter Smithson, «Mobility Road Systems», in *Architectural design* 28, 10, 1958)

Within this indetermination, the concept of interval suggests a pulsation of urban life, the rhythm of the quick individual movements and the encounters. Opposed to the rigidity of the *Plan Voisin* of Le Corbusier, the *Cluster City* bears the interest that the Smithsons nurture for the "flux".

Although the concept of "event" has been largely used by the Situationists in the same epoch, as being a value of absolute indetermination, the notion for the Smithsons wasn't directly linked to the Parisian theories; it derived from the exploration of popular actions. They mean places of condensation of social life, coming from the time of Golden Lane and the "street-building", or even the street network extended throughout the territory. While Guy Debord discusses at the *Internationale Situationniste* (IS, February 1958) the diagram made by Paul Henry Chombart de Lauwe [image], the regular and brief movements of a young girl in the 16th arrondissement in Paris, the Smithsons produce the diagram "Play Brubeck" [image], illustrating the model of a structure of complex exchanges, running in all directions and dispossessed of geographic limits, but for which it would still be possible, nonetheless - and just as in a piece of music - to find coherence. "*The form of the city must correspond to the network of human relations*", they claimed[31].

"Cluster City" - title of their article published in 1957[32] - explains how architecture's goal must be to define a 'carrying order', like an infrastructural project that provides space for variation and growth. This conglomerate of different textures has a heterogeneous structure, related to circulation and flow, and also to the complex juxtaposition of different forms of association. The idea behind the Cluster city is the one that the "network-city" must preserve or create strong centrality points, opposing to the unstructured sprawl of the suburbs. The "knots" or the "growing points" exist for their power of attraction in the ludic sense of the term and not by the definitive and monumental presence of the buildings. They act as "events" that are like a spectacle, subjected to the expectations of their consumers.

In 1970, in the first part of the book *Ordinariness and Light* - which displays the Golden Lane Project, the Smithsons defend that it would be necessary to construct an urban environment bearing a 'new density' in order to avoid the urban sprawl[33]. It is at this point that they proclaim, "we must contract our cities"[34], referring to history to defend the concept of a city at different levels: "*The attempt to contract towns is not new. Leonardo da Vinci designed a city whose pedestrian and service ways were separated - his two-level city. We must evolve a multi-level city*"[35].

31 The parallels between the sociologic analysis (1952) and Guy Debord's speech can be found in Simon Sadler's, "The Situationnist City", MIT Press, 1998 (p.95). The Sketch by A.P. Smithson has been published in "Mobility Road System" together with the quote. The relation between these two diagrams is made by Dominique Rouillard in the book *Superarchitecture: le futur de l'architecture 1950-1970*, p. 60.

32 Alison and Peter Smithson, "Cluster city", *Architectural Design (AD)*, november 1957.

33 Alison and Peter Smithson, *Ordinariness and Light urban theories 1952-1960 and their application in a building project 1963-1970*, The M.I.T. Press, Cambridge, 1970, p. 19.

34 *Ibidem.*

35 *Ibidem.*

How to recognise and read

MAT-BUILDING

Mainstream architecture as it has developed towards the mat-building

ALISON SMITHSON

Mat-building can be said to epitomise the anonymous collective; where the functions come to enrich the fabric, and the individual gains new freedoms of action through a new and shuffled order, based on interconnection, close-knit patterns of association, and possibilities for growth, diminution, and change. The way towards mat-building started blindly enough: the first Team 10 review of the field of its thought became collectively covered in the Primer (*AD* 12/61). The thought gradually got further hooded-out in projects, and these in the early 'seventies began to appear in built-form. At this point mat-building as an idea becomes recognisable. To be able to recognise the phenomenon at the end of this, its first, primitive phase, calls for a specially prepared frame of mind . . . to deliberately *not look too closely* at the detailed language for this is still developing. And some practitioners, to achieve something through the bureaucratic machine of their country, have chosen to *normalise* their language . . . (you might say so that the client did not become frightened by the appearance of the mat proper). So at present the built-field is rather mixed, and realised examples on the whole tend to have something of the not-quite-recognisable-order of the Olympian Zeus temple, all different wood/stone columns; or the crazy-paving terrace that is the top surface of the platform of the Argive Heraeum. Mainstream mat-building became visible, however, with the completion of the F.U. (Berlin Free University)[1]

A building that co-dates the finishing of the FU[2] – the Insurance Building at Appeldoorn – is, in its form, an off-shoot of the mat-building phenomenon (to deal with the off-shoot first, and perhaps therefore with 'casbahism' as a formative influence from the immediate past). Appeldoorn's architect, by using his own particular inheritance – the Children's House . . . the Schroeder roof – utilised a heavily loaded language to produce what can best be described as Giant's Causeway architecture . . . but you have to enter with special protective-visual-clothing, and to want to see it as part of the new phenomenon of mat-building. Causeway-architecture can most easily be seen to be *this something else* if walked into (in the mind) and compared with similar mental-walking-into, the Ford Foundation Building NY or the Boston City Hall, where, in both, quite different Central American historical-food is being drawn on, and has in the end produced old-style civic monuments. If still unconvinced that these are *isolates*, acting as such on the area around them, unto themselves alone, think of the Trenton Bath House (early '50s but first personal awareness '57), in which there is a clear indication of the mat-building urge towards collective grouping, and firm but recessive compatibility – seen again in the Baltimore Inner Harbour Project (1970)[3]

«How to recognise and read Mat-Building» by Alison Smithson
Source: *Architectural Design*, September 1974.

The logic of 'superposition' joined the idea of 'horizontal flux' and these became the two core themes on the Smithsons' work: "*We must confess that, at the time of the project for Berlin Haupstadt, we were obsessed by the intense horizontal movement of the individuals*".[36] The project retraced a city as a result of repeated crossroads - the suggestions of the citizen movements. The circulation diagram developed for the competition of Berlin Haupstadt represents the clearer example of a ramified structure superposing the existing built network[37]. Such stratification has been then more intensively developed in Toulouse-le-Mirail's project (1961-71) led by Georges Candilis, Alexis Josic and Shadrach Woods. Later, in 1962, Georges Candilis assumed the aim to "*re-establish the notion of the street*"[38].

1.2.5. The Mat Building - "A City under a single roof"

Gradually, the articulation of the concepts of *stem*[39] , *web*[40] and *cluster* found confinement within the *mat building* - a new model, able to embody a complex network of *stem*s and *cells* into a coherent architectural proposal. By means of its organizing network of support systems and circulation paths, the mat-building provides even higher flexibility for unifying diverse clusters of activity within a unitary container. "*It can grow along any of its stems in two dimensions*", while simultaneously maintaining "*a coherent and systematic interconnected order*"[41]. "Within a single roof" the potentials of the horizontal organization, interconnection - close-knit patterns of associations would coexist.

Association or dissociation? The confrontation of these two terms is used as motto for the project that Shadrach Woods, George Candilis and Alexis Josic propose for the competition of the Free University of Berlin - which is also the fundamental built paradigm of *mat-building*. The two possibilities are confronted on two diagrams published aside, part of the competition panels of 1963. 'Dissociation' represented

36 Alison and Peter Smithson, *Urban Structuring – Studies of Alison & Peter Smithson*, *op. cit.,* p. 39.

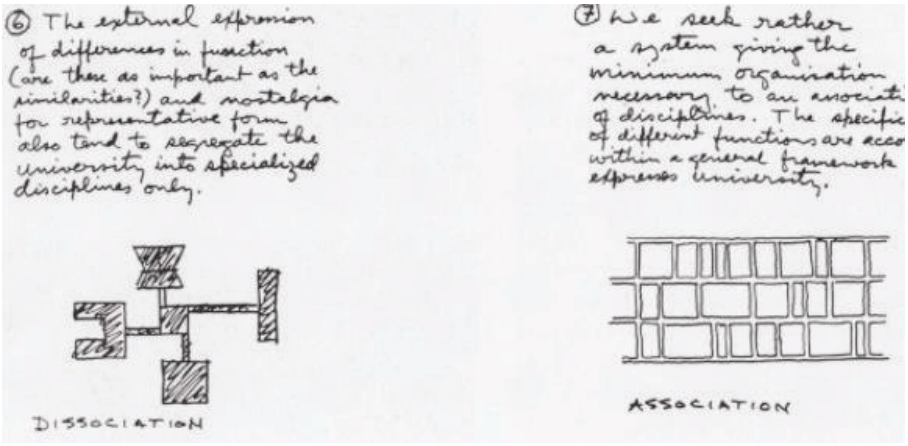
37 Stefania Curea Kenley, "Enfants dans la rue et le land rover sur le deck - Le concept de 'connectivité urbaine' dans les projets d'Alison et Peter Smithson", in Bruno Fayote Lussac et Rémi Papillault, *Le Team Ten et le logement collectif à grande échelle en Europe*, *op. cit.,* p. 35.

38 George Candilis, "A la recherché d'une structure urbaine," *L'Architecture d'Aujourd'hui*, nº 101, 1962, p. 51.

39 The *stem* article by Woods intended to introduce a dynamic approach to urban design. Under the heading of 'mobility', Woods underlined that a dynamic approach to planning would be better adjusted to the rhythms and practices of post-war society. The re-establishment of the street in the practice of Candilis-Josic-Woods should be situated within the perspective of both understandings of the structural role of the road. Source: http://www.team10online.org/research/papers/delft2/avermaete.pdf (28/02/2016). Both the structural characteristics of the physical form and the spatial practices and experience of the road played a major role in the partnership's approach. "*the basic axiom that every extension to the city is an extension of the city and cannot be considered as a self-contained unit, isolated by its introspective nature from the rest of society*", Shadrach Woods, 'Stem', *Architectural Design*, nº 5, 1960, p. 181.

40 The concept of *web* bears an alternative to the traditional urban fabric, representing also a shift in Candilis-Josic-Woods' initial approach. This strategy is said to marry architecture and planning by discussing the organization of places through the establishment of activities into a system of relationships that form multiple polarities. According to Woods, the *web* is an environmental polycentric system – bearing multiple local centres formed through use after individual action: "*It is a way to establish a large-scale order which, by its existence, makes possible an individual expression at the smaller scale.*" See: Shadrach Woods, "Web," *Le Carré Bleu,* nº 3, 1962.

41 Jaime Ferrer, "Mat urbanism: growth and change", *Projections: MIT student journal of planning*, nº 10, 2011, p. 73-83.



Candilis, Josic & Woods, sketch for the competition of the Free University of Berlin, 1963.
Source: Shadrach Woods, *Candilis-Josic-Woods; Building for People*, F.A. Praeger, New York, 1968, p. 208.

a set of spaces distributed along a central vertical core, formally determined by the requirements and specificities of the different programs. The exterior appearance of the building would therefore reveal the expression of the different programs. 'Association' represented a system made of repetitive cells, organized in modular grids that were then displayed horizontally, free of any functional determinism: it was the minimum organization necessary to an association of disciplines[42].

Amongst the two [image], it is clear that Woods's intention is to proclaim "association" as his key project strategy - a way of denying the limits of modernism and the preponderance of the architectural building as a single isolated object. As part of a tendency that increasingly enhanced the supremacy of the horizontal mat buildings - going beyond the limits established by the modernism - these buildings seemingly refuse the effect of the "monument", merging architecture and urbanism to create a centre of interest, oriented to the human regroupment and its interaction with the built environment.

The project - described by the authors as a 'city in miniature' – contains most of its public programs at the ground level, with the upper floors being occupied with an orthogonal grid to the exclusive use of the pedestrians. The design envisions an superimposed scheme of broad passageways linking to the zones of the building with most intense activity and a secondary system of walkways serving the calmer areas. The subsequent scheme, a 'groundscraper' layout, allows for multiple chances for socialization and interaction among the different uses and users, and yet each part keeps its individual autonomy. "*Large pedestrian pathways, ramps and escalators connect clusters of rooms into a two-layer mat that extends over the entire project site. The juxtaposition of platforms, open spaces and covered pathways generates a continuous and spatially diverse structure*"[43].

Alison Smithson mentioned later that "*the Berlin Free University makes mat-architecture recognizable*"[44]. The 'mat-building' is defined as a scheme whose logic is "*based on three parameters: interconnectivity; relational patterns; and opportunities for growth, decline and change*"[45].

The description thrown by Alison Smithson to explain the concept of the mat-building was the following: "*Mat-building can be said to epitomize the anonymous collective; where the functions come to enrich the fabric, and the individual gains new freedoms of action through a new shuffled order, based on interconnection, close knit patterns of association and possibilities for growth, diminution and change.*"[46]

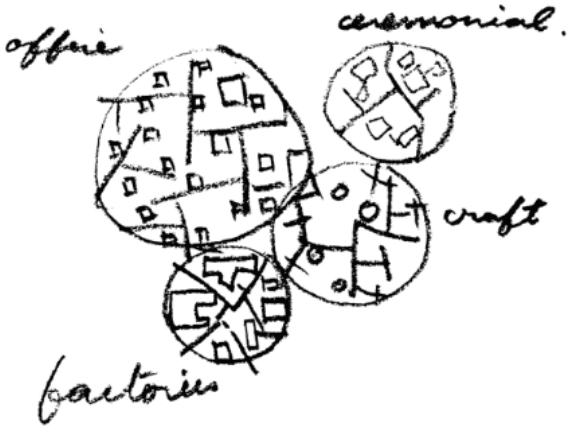
42 See Bruno Marchand, "La nature organique des formes de la croissance, Le cas particulier des structures en nappes horizontales", *Matières 8*, 2006, p. 21.

43 Jaime Ferrer, "Mat urbanism: growth and change", *op. cit.*

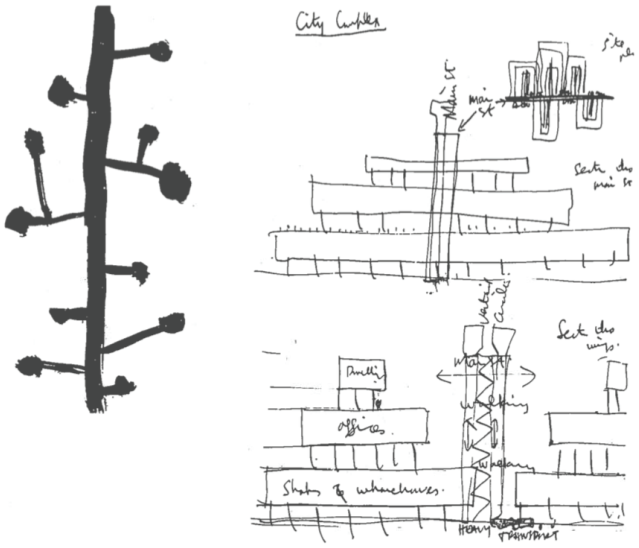
44 Alison Smithson, "How to recognise and read mat-building", *Architectural Design*, September 1974, p. 574.

45 *Ibidem.*

46 *Ibidem.*



Pattern of association - each district with a distinct function, Diagram A. S. 1953
Source: Alison Smithson (ed.), *Team 10 primer*, Published by The M.I.T. Press, London, 1974.



Ideogram of Infill to a village - completing and making clear an old structure so it can serve today's needs, Alison Smithson, 1959.

City Building Ideogram, 1956.
Source: Alison Smithson (ed.), *Team 10 primer*, Published by The M.I.T. Press, London, 1974.

Being the opposite of a fixed architectural structure, the mat represents a generative system in which urban forms are defined by the singular features of the specific places or by particular social patterns, remaining open to transformation. The mat-building was said to allow for a flexible functional arrangement throughout time, ensuring the efficient longevity of the building: "*its very realization is spread out over time and subject to revision and adaptation*"[47]. "*The systems will have more than the usual three dimensions*," said Alison Smithson, "*they will include a time dimension*."[48]

The mat-building seems to provide efficient solutions to the "*recurring calls for efficiency in land use, indeterminacy in size and shape, flexibility in building use, and mixture in program*"[49]. Considering such challenges, in most of the architectural publications on the subject "*the mat claims to address a wide range of problems preoccupying contemporary architecture*"[50]. The principles behind the mat-building are seen by Stan Allen as a simultaneous response to the issues of contemporary architecture and urbanism, describing the mat-buildings as "*a shallow but dense section activated by ramps and double-height voids, the unifying capacity of a large open roof, a site strategy that lets the city and the landscape flow through the project, a delicate interplay of repetition and variation and the incorporation of time element as an active variable in urban architecture*"[51].

The mat building approach is also latent in Candilis-Josic-Woods's project for the reconstruction of Frankfurt-Romerberg city centre in 1963. The project description refers to a network, a seemingly adaptable megastructure that had the potential adapt to the city's future transformations – functional hybridity is highlighted as an added value to the scheme. The project envisions the inclusion of housing, offices, hotels, retail and other cultural amenities: "*different activities enabling the building to always be seen as a complex living organism*"[52]. Recalling, in some aspects, the strategies used in the project of Berlin's University, this project is structured around a grid of pedestrian paths that connect the public activities. Whereas the public program is located at the lower level, the housing areas occupy the higher levels. Candilis-Josic-Woods highlight the fact that the exercise of conceiving this innovative urban project implies the application of new architectural strategies: "*Such diversity of activities needs to be housed, that if all of these had to be considered separately, the result would be chaos. These diverse elements must be made into a whole, a single organism*."[53]

47 See Jaime Ferrer, "Mat urbanism: growth and change", *op. cit.*

48 *Ibidem.*

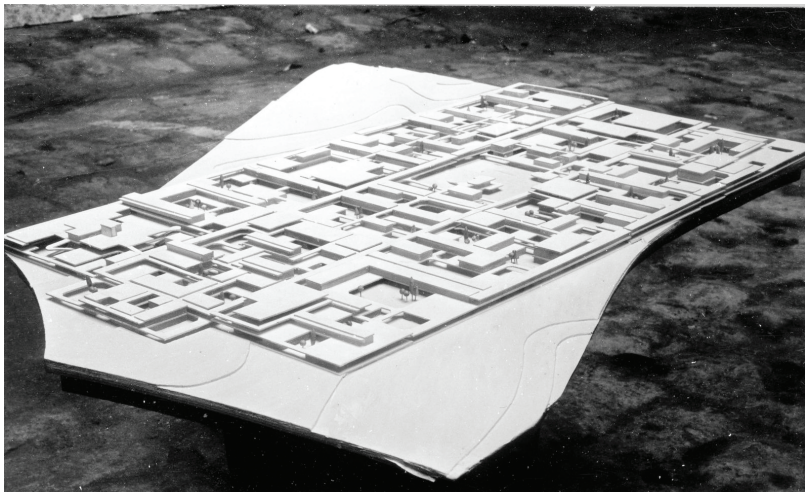
49 Hashim Sarkis, « Mats Today », *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, Prestel Publishing, 2005, pp. 12-16.

50 *Ibidem.*

51 Stan Allen, "Mat Urbanism: The Thick 2-D", in Sarkis, Allard, Hyde, *Case: Le Corbusier's Venice Hospital and the Mat Building Revival*, New York: Prestel, 2001.

52 Bruno Fayolle-Lusac, Rémi Papillault, *Team X Et Le Logement Collectif à Grande Échelle En Europe*: *Un Retour Critique Des Pratiques Vers La Théorie*, *op. cit.*

53 Georges Candilis, Alexis Josic, Shadrach Woods, "Recherches d'Architecture", *L' Architecture d'Aujourd'hui*, nº 115, 1964.



Candilis, Josic & Woods, model for the competition of the Free University of Berlin, 1963
(source: Architectural Design, September 1974)

Venice Hospital: Le Corbusier + Jullian de la Fuente. 1964
(source: Architectural Design, September 1974)

Besides bearing the capacity to accommodate evolution and variation within its boundaries, The Frankfurt mat proves that "*the scale, grain and traces of the surrounding urban fabric are reinterpreted at the ground level of the project, as an attempt to harmonize the project and to dissolve it in the existing urban tissue"*[54]. The mat's circulation network mimics the site's existing grid of pedestrian pathways.

Such strategy and a very similar wish for the transposition of the complex and wealthy relational logics of the city into a building may also recall Le Corbusier's project for the Venice Hospital, started in February of 1964. Tim Benton highlights its innovative appeal: "*The project for the hospital in Venice is particularly interesting because it proposes not only a new approach to urban organization and circulation but also a new concept for how to live*."[55]

Inspired on the urban structure of Venice, the building somehow reconciles Le Corbusier's approach with the practices of the Team 10: "*The Venice hospital project derived its inspiration primarily from the city of Venice itself; the project also remained very much embedded within the architectural and urban debates of the early 1960s (…). This inspiration from the city, according to Jullian de la Fuente, remained more an exercise in 'memory' and hence a replication of the essence of the city, rather than its physical mimicry (…). Le Corbusier identified this 'generic unit' through the analysis of the inner networks, the streets, the squares and the hanging gardens, supposedly replicating their ability to generate movement and growth within a small unit embedded in a certain quarter of the city as well as the city itself*."[56]

Mario Botta describes the project as a *miracle of synthesis* of the complexity of a flexible and open organism articulated with the city: *"(…) il progetto è pensato come una parte ed un organismo che coinvolgono la città. (…) L'architetto delle grandi forme plastiche elabora un miracolo di sintesi di fronte ad un organismo tanto complesso e propone, in luogo di una forma definita, un organismo aperto, disponibile e flessibile per le sue differente attività, ma che riesce a conservare una struttura razionale e logica di organizzazione e di sviluppo che costituisce un monumento di osmosi con l'organizzazione spaziale del tessuto urbano"* [57].

54 See Jaime Ferrer, "Mat urbanism: growth and change", *op. cit.*

55 Tim Benton, "Foreword" in Mahnaz Shah, *Le Corbusier's Venice Hospital Project. An Investigation into its Structural Formulation*, Ashgate Publishing Limited, Farnham, 2013.

56 Mahnaz Shah, *Le Corbusier's Venice Hospital Project. An Investigation into its Structural Formulation*, *op. cit.*, p. 52.

57 Mario Botta, "L'ultimo progetto de Le Corbusier", in Bruno Reichlin (ed.), *Le Corbusier : la ricerca paziente : Rassegna internazionale delle arti e della cultura; Lugano, 6 settembre-16 novembre 1980,* Federazione Architetti Svizzeri (FAS), Gruppo Ticino, Lugano, 1980, pp. 144-145.

Rem Koolhaas, Hans Obrist, ***Project Japan: Metabolism Talks,*** Taschen, Köln, 2011.

Source: www.taschen.com

1.3. Bigness and Complexity

1.3.1. An alternative model: the potentials of the Vertical Densification the contribution of Rem Koolhaas

In a first approach, it might not be evident to find common points or direct links between the architectural production of the 1950s and 1960s (the Team 10, the Megastructures, the Metabolists, the Radical Utopias) and the nearly contemporary theoretical and practical realizations of Rem Koolhaas and his Office for Metropolitan Architecture (OMA). And indeed, despite relatively close in time and on its base purposes, Rem Koolhaas's method bears witness to a very different approach to the subjects of *large scale* and *density,* focusing on the observation of an existing model – Manhattan - and on its immanent **strategy of vertical densification.**

Referring to the postwar architectural production, Koolhaas highlights the contribution of the Team 10 (and implicitly their design freedom and influence) - "*The mid-sixties are maybe the last moment of architectural confidence. Urban renewal, ostensibly at its zenith, has exponentially expanded the scope of the urbanist. (…) Team 10 makes an effort to humanize the central/vision model of CIAM, partly through the injection of non-western sources – African villages, Yemenese desert towns and other foreign associations.*"[1]

Simultaneously, Koolhaas emphasizes his admiration for the work of the Metabolists, Kenzo Tange, Kisho Kurokawa, Fumihiko Maki, Arata Isozaki: "*The most exciting movement of the early sixties is Japanese*"[2] and on the use of "*organic, scientific, mechanistic, biological and romantic (sublime) vocabularies to face a climate of acceleration and instability*"[3], concepts that have been further illustrated in the book *Project Japan: Metabolism Talks*[4] in 2011. [images]. The fundamental differences that these architects introduce, when compared to the European practice, is that "*they do not avoid the central issues of the quantity – the masses*"[5].

During these decades when the concept of *density* [a theme that is explored in the chapter 3 of this thesis] and a consequent 'complexification' of architecture stood out as dominant themes, several architects have explored the subject of '*city within the city*' - a formula that was meant to allow cities to grow and evolve within their own pre-established boundaries - alongside with other possible modes of densification within self-contained architectural devices. In moments that were chronologically not so distant, very different approaches to complexity have been developed. We have mentioned above the idea of '*recreating a relational urban*

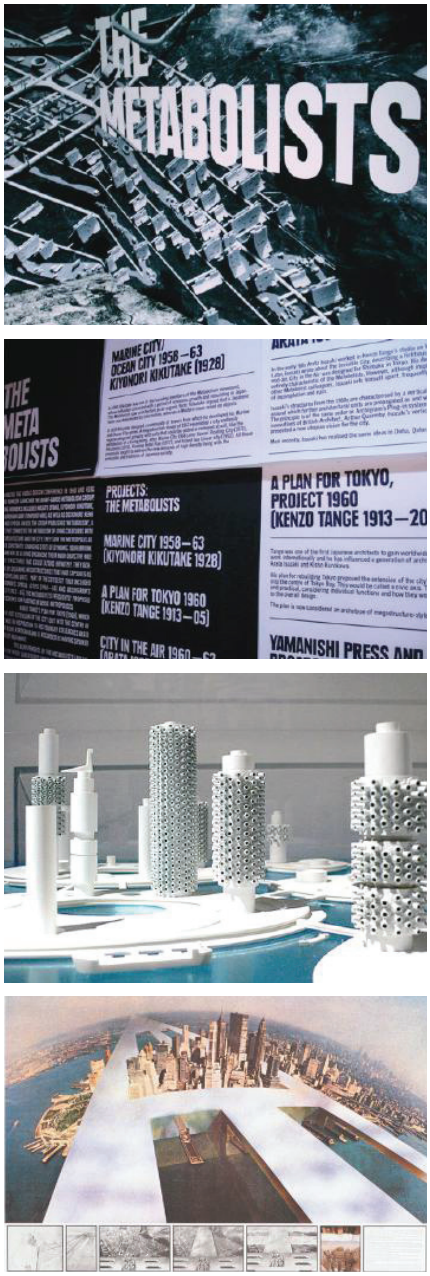
1 Rem Koolhaas, "The Responsible Corporate Citizen", in *S,M,L,XL*, The Monacelli press, New York, 1995, p. 1043.

2 *Ibidem.*

3 *Ibid.*

4 Rem Koolhaas, Hans Obrist, *Project Japan: Metabolism Talks*, Taschen, Köln, 2011.

5 *Ibid.*



Exhibition *Future City: Experiment and Utopia in Architecture 1956-2006* held at The Barbican, September 2006, London.

Source: Exhibition Catalogue, September 2006.

wealth' as form of densification and to deviate from the design the architectural object itself[6], to which the predominant concept was the one of *horizontal flux*, the *fairness of architecture*[7] and the general idea of linking and connections, which was shared by the Team 10 and the Metabolists[8]. Several architectural schemes and provocative projects of Utopia have been proposed, with the intention of agitating minds and triggering new dynamics to be projected in the architectural scene of the future - opening precedents to innovative forms of conceiving and building architecture. Only a few of these projects have been built. The exhibition *Future City: Experiment and Utopia in Architecture 1956-2006*[9] [image] has displayed Rem Koolhaas's *Delirious New York* in that same line of Utopia, and yet hiding a form of subversion; it was up to the *reality of Manhattan* to deliver a form of *architectural surrealism* - to turn all the Utopia into the reality of the city.

Although initially inspired by the Radical strategies[10] (and still acknowledging the work of the Team 10), Koolhaas has chosen to follow a different strategic path, yet still focusing on the fundamental questions raised since the early 1950s: how to create interesting strategies for densification; how to trigger a desirable form of density, more sensible to the diverse and changeable living modes of the individuals?

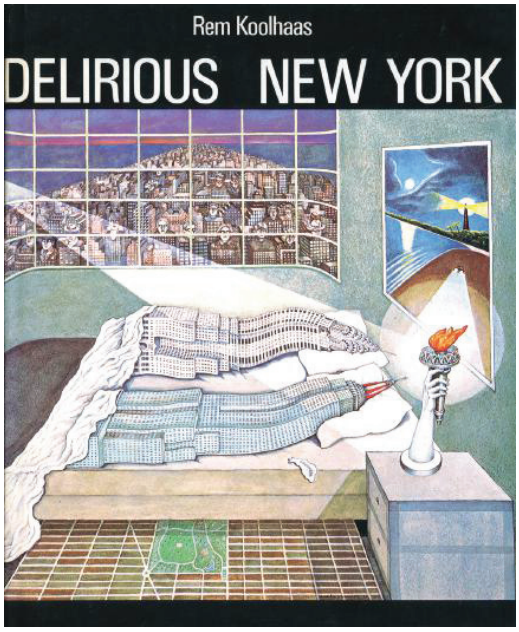
6 Dominique Rouillard refers to the decades of 1950s to 1970s saying: *"(…) des constructions structurale-plastiques des formes inédites pour loger l'humanité de demain. L'interrogation sur le futur se traduit par une "réduction" de l'architecture: à des usages, à des structures, à des visages, à des surfaces, à des réseaux, à des effets chimiques, à des performances artistiques, à un objet de consommation, à une pure technologie. Elle ne vise pas l'invention d'une "nouvelle architecture", mais tend vers une nouvelle définition, dont l'horizon serait de faire disparaître l'architecture comme forme, présence, ordre, durée…, autant d'obstacles à la vie.", in* Dominique Rouillard, *Superarchitecture - le Futur de l'architecture* 1950-1970, Éditions de la Villette, Paris, 2004, p. 11.

7 *Ibidem*, p.13.

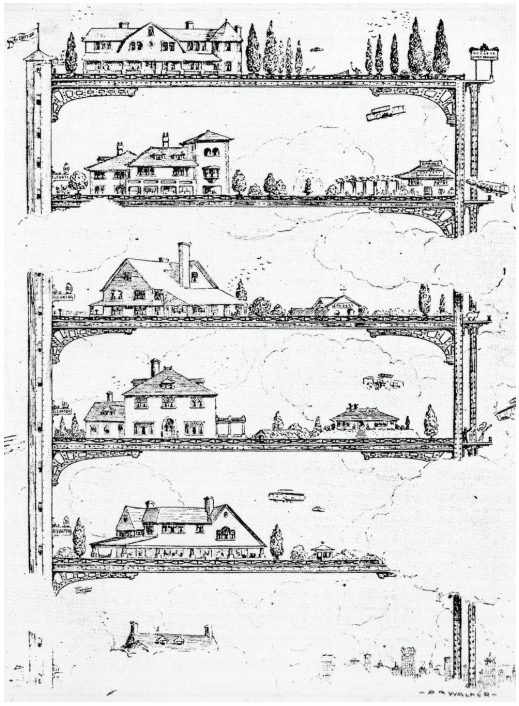
8 Rem Koolhaas quotes Fumihiko Maki to endorse his belief that the designed connections (of the buildings produced for masses) must focus on adaptable and evolving forms of linkage: "*Like the Team X, Maki is obsessed with connections. To achieve the master form – a form of 'weak' coherence – he proposes: "Link: linking or disclosing linkage, are invariant activities in making collective form out of either discrete or associate elements. In operational terms there are a number of linkages – physically connected link, implying link, built-in link... By the same argument, the rapidity with which the urban system expands suggests that there must be some means for linking newly established parts with parts not yet conceived. In short there is need of something that may be termed 'open linkage'*.", Rem Koolhaas, *S,M,L,XL*, *op. cit.*, p. 1049.

9 Exhibition *Future City: Experiment and Utopia in Architecture 1956-2006* held at The Barbican, London, in September 2006. Many projects of Utopia have been displayed at this exhibition and Rem Koolhaas manifesto for Manhattan has been exhibited aside these projects.

10 See Rem Koolhaas's project while student at the AA - "Exodus", 1972 (published in *S,M,L,XL*), in collaboration with the Greek architect Elia Zenghelis. Its representation methods were indeed very close to the ones used by the Italian Radicals. In fact, two years before the conception of Exodus, Rem Koolhaas had traveled to Florence to meet Superstudio and, through them, also Archizoom. These two groups proclaimed a fascination towards the great walls: "*The Great Wall of China, Hadrian's Wall, motorways, like parallels and meridians, are tangible signs of our comprehension of the hearth*" (Superstudio in 1969, regarding the project *Monumento Continuo*). A similar fascination is proclaimed by Koolhaas in Exodus, through a recurrent representation of the Berlin wall. Both Superstudio and Archizoom have used images as the main tool for the representation and construction of their own architectural thinking. See Jeffrey Kipnis, *Perfect acts of architecture*, Museum of Modern Art, New York, 2001.



Rem Koolhaas, ***Delirious New York: A Retroactive Manifesto for Manhattan***, 1978



1909 Theorem: the Skyscraper as utopian device for the production of unlimited numbers of virgin sites on a single metropolitan location.

Source: Rem Koolhaas, *Delirious New York*, 1978, p.83.

Koolhaas has had the vision and the cleverness to launch an architectural strategy that not only was strategically opposed to the *endless horizontal mats and megastructures*, but which claimed to be sustained on the most powerful of all attributes: evidence. He recognized Manhattan as a "*mountain range of evidence without a manifesto*"[11] and by looking back at evidence, Koolhaas retraced the potentials of the forms of *congestion* and *vertical staggering* as a potential solution to be applied in future urban schemes.

1.3.2. The Culture of Congestion: Manhattan as case-study

In 1978, Rem Koolhaas made Manhattan his focus, willing to "*trace, distill and retrospectively extract the essence of the city*"[12]. He recognized how skyscrapers had the potential to "*entrain many functions and enjoy almost surreal spatial juxtapositions in their many stacked floor plates*"[13] - and how this suddenly got to be an obvious answer to the architectural questions raised during the precedent decades. Indeed, Koolhaas announces Manhattan as an exemplary model for the metropolises of tomorrow.

Aside with depicting the city as a metaphor for the incredible variety of human behavior, he recognized that certain parts of the city were informed with a "*peculiar history and genius loci that resonates through time, informing names and spaces of what comes after*"[14] - just as a livable and evolving organism. Koolhaas retrospective manifesto, *Delirious New York* (1978)[15] [image] exposes these notions, illustrating his thesis on the living body of New York, whilst also proposing new eclectic architectural forms to add to New York's own - "*he beds his visionary zeal for the future city in a deep understanding of how the metropolis grows, consumes, shops, relaxes and re-digests itself*"[16].

Koolhaas starts by describing the "Pre-historical" past of Manhattan as a way of giving strength to his theory. Koolhaas depicts the discovery of the island by the Dutch in 1609 in a symbolic way: as an empty field, a 'Theatre of progress' ready to host the inception of 'A Utopian Europe'. Such utopia is meant to go beyond topography, by means of "*imposing the mental over the real*"[17]. He proceeds by describing the establishment of the grid in Manhattan's empty land, in 1807, as the most strict of all urban gestures, leaving no space for interaction between fragments or any kind of spontaneity.

11 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, *op. cit*., p.9.

12 Jane Alison, Marie-Ange Brayer, Frederic Migayrou, and Neil Spiller (Eds.), *Future City - Experiments and Utopia in Architecture 1956-2006, (Exhibition Catalogue)*, Barbican Centre, London, 2006.

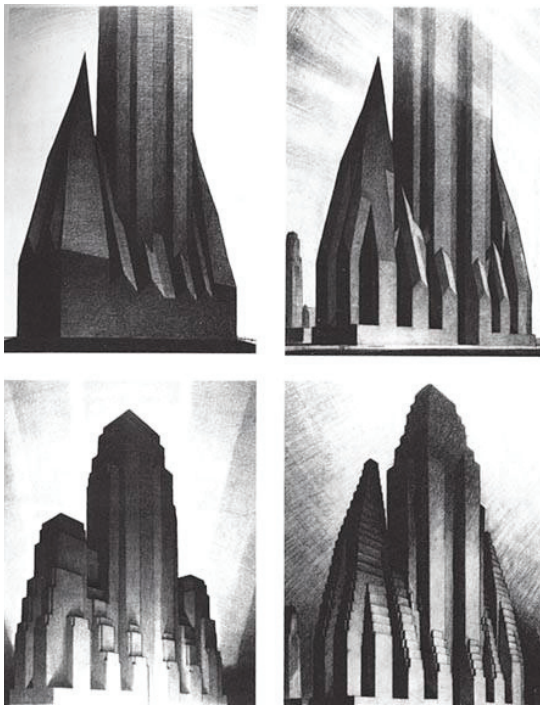
13 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, *op. cit.*

14 *Ibidem.*

15 *Ibid.*

16 *Ibid.*

17 Emma Watson, *Review of Rem Koolhaas: Delirious New York: A Retrospective Manifesto for Manhattan,* May 2010. Source: http://architectureandurbanism.blogspot.ch/2010/05/rem-koolhaas-delirious-new-york.html (28/03/2016).



Illustrations by Hugh Ferriss, 1929.
Source: Rem Koolhaas, *Delirious New York*, 1978, p.112.

As time went by and Manhattan mutated from a city into a metropolis, the ever-growing population and the limited perimeter of the island forced the inventiveness towards the creation of Manhattan's *own sort of architecture*[18] - the one made of cuts on the envelope as implicit in Hugh Ferriss's illustrations [image]. The two dimensional restrictions of the grid gave then way to a three dimensional freedom: the *mass ascension*. The fundament is implicit in the 1909 theorem [image]: "*the skyscraper becomes an utopian device for the production of unlimited numbers of virgin sites on a single metropolitan location*"[19].

As the vertical growth evolves, it intensifies the *culture of congestion*. Koolhaas saw in the congestion "*a recognized social and cultural quality*" [20], and "*presented Delirious New-York as a "Blueprint for a Culture of Congestion" and thus declared himself a defender of urbanism as a socio-spatial theory*"[21].

Less and less space seems indeed to have the effect of busting the attractiveness of the metropolis. "*The island is forced to mutate; it must turn itself into the very opposite of nature*", and instead of providing a release from the urban pressure - as per Le Corbusier's projects and theories[22] - Manhattan provides intensification. "*The island's artificiality becomes an attraction, counteracting the theatricality of the new metropolis with its unique 'super-natural'*"[23]. The technological innovations enabled by the combination of the elevator and the steel frame allowed the construction in height and ultimately the multiplication of new territories. "*Any site could now be multiplied ad infinitum to produce a proliferation of floor space*"[24]. The skyscraper became indeed that new utopian technique that could be seen as an instrument to the service of a new form of urbanism.

18 Hugh Ferriss's illustrations of mega-village suggest Manhattan's own architecture.

19 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, *op. cit.*

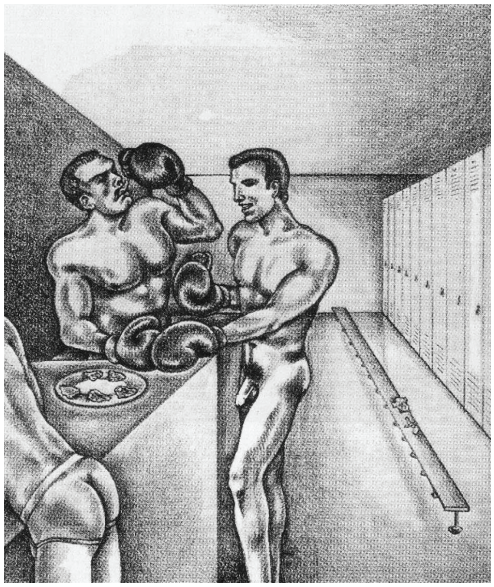
20 *Maarten Hajer, "The Generic City", Theory, Culture & Society -SAGE, 1999, pp. 137-144.*

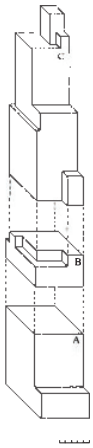
21 *Ibidem.*

22 Emma Watson, *Review of Rem Koolhaas: Delirious New York: A Retrospective Manifesto for Manhattan, op. cit.: "Manhattanism is 'congestion for congestion's sake', and the reason why any of Le Corbusier's schemes failed to be realized in Manhattan. Radiant City, which Koolhaas describes as 'a majestic flow of humanist non sequiturs', is a proposal to erase all the utopian urbanistic ideals upon which Manhattan was built and replace them with a uniform set of towers – Cartesian skyscrapers - evenly planted in green spaces. His desire was to purify the city, and give its residents access to light and air. His urban form removed the congestion, offering only the efficiency of banality in exchange. This congestion, in a realm divorced from reality, forces the metropolis ever upward into the speculative. There was no place for Manhattan's technology of the fantastic within the Cartesian skyscraper, for Corbusier; 'use of technology as instrument and extension of the imagination equals abuse…for him technology itself is fantastic'. The Cartesian skyscraper had been stripped of the stone cladding that enclosed the Manhattan skyscraper and allowed the 'ideological hysteria' of the internal architecture to thrive. Koolhaas concludes that the glass walls of Corbusier's skyscraper enclosed 'a complete cultural void'."*

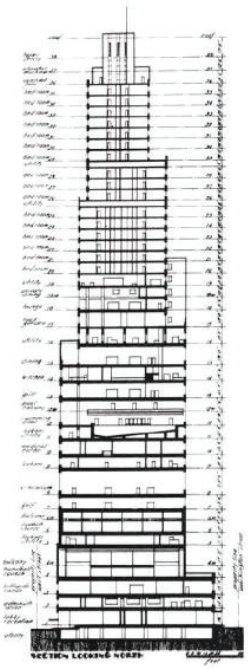
23 *Ibidem.*

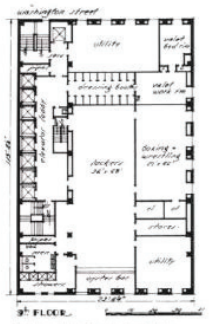
24 *Ibid.*

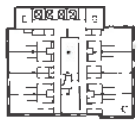




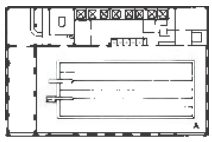
A. Athletic club
B. Restaurant
C. Hotel







Twenty-sixth floor



Twelfth floor

«*a machine for metropolitan bachelors...*»

Downtown Athletic Club, New York, 1931 - Starret & Van Vleck, Duncan Hunter.

Source (left) : Rem Koolhaas, *Delirious New York*, 1978, p.154, 159.

Source (right): Joseph Fenton, *Hybrids*, 1978, p.20.

Besides its primordial role on mass ascension, the mechanical elevator represents "*the first esthetic based on the absence of articulation*"[25]. As described by Jacques Lucan "*the stacking of the floors in the high-rise imposes the discontinuity as inherent to the conception process of the project*"[26].

The break with the former architectural theories of the 1950s and 1960s – developed horizontally - is implicit in Koolhaas's words: "*the use of the elevator - its revolutionary status – as architectural "rupture" is still in its childhood, and its real potential has never really been explored. It assumes a liberating role in architecture because he frees from the stupid obligation to establish architectural relations between the different parts of a building*"[27].

For the architect, the potential of such architectural strategy is the freedom to juxtapose very different or even contradictory programs within the same envelope, arguing once again for the social potential of such tensions. An illustration is given through the famous "Downtown Athletic Club"[28] [image] where boxers eat fresh oysters with their boxing gloves on [image].

Indeed, the architectural scene of Manhattan underwent a lobotomy since gradually, as described in Delirious New York, "*less and less surface represented more and more internal activity*". In the skyscraper monolith, the envelope acted as an agent of disinformation and separation between internal and external worlds: the container and the contained were now non-related entities. The act of arriving to a Manhattan edifice and moving through its different floors could be like moving between different worlds within a unique container, an aspect that Koolhaas refers to as the 'vertical schism'. This form of disconnection somehow allowed the skyscraper to remain a wild and evolving organism. And this is indeed one of Manhattan's most intense themes: each new building spanning a block, each one seeking to become a *city within a city*, a collection of *islands within an island*, all potentially competing with one another.

Koolhaas has introduced the key themes, which were to be optimized within the the Rockefeller Center's description - "*a city within a city exemplifying the financial viability of the skyscraper and representing congestion on all possible levels*"[29]. As a model of functional hybridity, the Rockefeller does not respond to the premises of hierarchy or to any identifiable building typology: "*the vertical schism, which creates the freedom to stack such disparate activities directly on top of each other without any concern for their symbolic compatibility*"[30]. To fit a brief "*the center must*

25 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, *op. cit.* p. 68.

26 Jacques Lucan, *Composition, Non-Composition – Architecture and theories XIX° & XX° centuries*, PPUR, Lausanne, 2009, p.548.

27 O.M.A., *OMA - Fin de siècle,* Exhibition in Paris, 1990.

28 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, *op. cit.,* p. 159.

29 Carrie Bayley's Review of Delirious New York, February 2011,
Source: <http://architectureandurbanism.blogspot.ch/2011/02/rem-koolhaas-delirious-new-york.html> (20/03/2016).

30 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, *op. cit.*

Rockefeller center

Image: © Samuel Gottscho 1933. (Web Source)

combine the maximum of congestion with the maximum of light and space". Work of a collective of architects, the Rockefeller Center [image] is described by Koolhaas as "*a masterpiece without a genius*" and is also pointed out as "*the fulfillment of the promise of Manhattan*". Koolhaas highlights it as the project where "*all paradoxes have been resolved*", becoming thus a valuable influence to city planning - and a possible key for a sort of complexity that is about to be latent in the manifesto of Bigness.

1.3.3. Scale and Complexity

The scale subject has always been recurrent in the architectural and theoretical production of Rem Koolhaas and OMA. Indeed, although the bewilderment that gravitates around the notion of *scale* is everything but new, it is interesting to notice that the term has become a flashy *leitmotif* in today's architectural debate, and largely due to the practical and theoretical contribution of Rem Koolhaas and his office OMA. His acclaimed theoretical essay on the subject of *scale* and *complexity,* entitled "Bigness or the problem of large"[31], has firstly been published in the magazine *Domus* in 1994, and then re-edited and re-published in the book *S,M,L,XL*, in 1995.

The popularity of the subject became clearer in 1999, when the magazine *Les Annales de la recherche urbaine* published an entire volume dedicated to the scale issue, entitled "Les échelles de la ville"[32], focusing simultaneously on the publication of *S,M,L,XL* and on the completion of the Euralille project[33] [image on the next page], both by Rem Koolhaas/OMA. These have ultimately been central themes in multiple articles and publications at the time and, since then, Koolhaas's theories and built works became key references to the contemporary architectural discourse. Yet, if the publication of *S,M,L,XL* has somehow consolidated Koolhaas's interest over the theme of *scale*, the truth is that the main ideas behind the theory can also be found in earlier and later works from the author: its fundamental precedent, the book *Delirious New York,* contained a "*latent theory of Bigness*", whereas the subsequent completion of the CCTV in Beijing [image on the next page] (together with other Big Buildings) or even the above mentioned recent publication of Project Japan[34]. His obsession over the scale issue is so clear that Bruno Latour writes: "*To me, everything in Koolhaas's work seems to depend on this size issue*"[35]. And indeed, the themes of *scale and complexity* seem to act as constant premises between the ensemble of his theoretical and built works.

31 Rem Koolhaas, "Bigness or the problem of large", *Domus*, n°764, Oct. 1994.

32 "Les échelles de la ville", *Les Annales de la recherche urbaine*, 1999, n°82.

33 "*The title of the latest book by Rem Koolhaas and Bruce Mau S,M,L,XL on one hand, the chapter he devotes to the concept of Bigness on the other hand, the production of Eurallile finally, show three ways of recurrence of those issues*." *in* Philippe Boudon, "Échelle en architecture et au-delà", *Les Annales de la recherche urbaine*, n°82, 1999, p. 5.

34 Rem Koolhaas, Hans Obrist, *Project Japan: Metabolism Talks*, Taschen, Köln, 2011.

35 Bruno Latour, "En tapotant sur Rem Koolhas avec un baton d'aveugle", *Architecture d'Aujourd'hui*, Nov-Dec, n°361, (pp.70-79).

OMA, CCTV Headquarters
OMA, Euralille
Source: © OMA

As mentioned above, the whole narrative of the manifesto "Bigness or the Problem of Large"[36] argues for a "Theory of Bigness" that was already latent in Koolhaas's first book *Delirious New York*[37] and that has eventually been applied to the OMA projects during those 15 years in between the two publications. The author describes his theory through five fundamental theorems: one that defines Bigness as an architecture of a maximum scale and intrinsic monumentality, the second stating that Bigness enables an exceptional internal programmatic complexity that remains hidden behind the apparent stability of its façade, one that mentions the elevator (and the new technologies introduced in construction during the machine age) as the trigger for the vertical growth, and finally the idea that through its massive scale alone, and regardless of the quality of its design, Bigness has a huge impact on the city - and, ultimately, Bigness is "*no longer part of any urban tissue*"[38].

Ultimately, these five theorems that define Bigness are grouped into some that focus specifically on architectural subjects and other that implicitly refer to broader urban issues, somehow evoking the mounting structure of *S,M,L,XL*. Indeed, the book - a compilation of 20 years of projects by Koolhaas and OMA - is organized into groups of growing scales: whereas S and M relate to architectural design and XL to urban projects, L seems to refer to a whole new condition - **Bigness - a new discipline that is neither architecture nor urbanism**.

The main purpose of Koolhaas regarding the issue of *scale* seems indeed to concentrate on the exploration of the problematic that is raised by this difficult classification of a model that occupies an ambiguous status, somewhere in between architecture and urbanism, gathering principles and challenges that belong to the two disciplines. In a certain way, the concept of Bigness seems to act as a hinge between architectural and urban theories, and this aspect is highlighted by Rem Koolhaas himself in *S,M,L,XL*: "*If Bigness transforms architecture, its accumulation generates a new kind of city. (...). The street has become residue, organizational device, a mere segment of the continuous metropolitan plane (...). Bigness can exist anywhere on that plane. (...). Bigness no longer needs the city: it competes with the city; it represents the city; its preempts the city; or better still, it is the city*."[39]

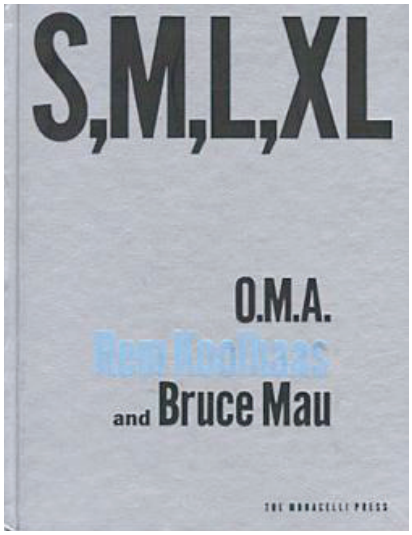
Some questions could indeed be raised from the issues mentioned above: can such architecture ever become a new form of urbanism, or even substitute itself to urbanism? From which limit size does architecture eventually become urbanism? What is the real impact of Bigness in the city? What does an accumulation of Bigness eventually represent to the city?

36 Rem Koolhaas, *S,M,L,XL, op. cit.,* p. 499.

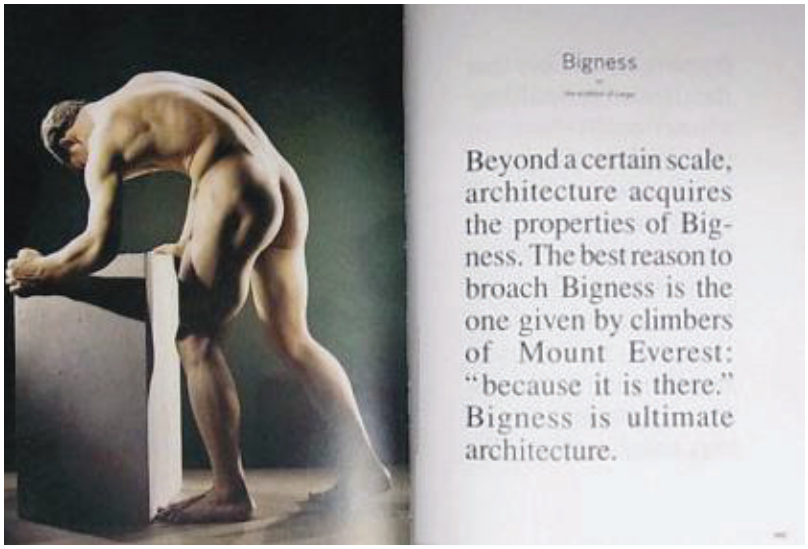
37 Rem Koolhaas, *Delirious New York, a retro-active manifesto for Manhattan*, *op. cit.*

38 *Ibidem,* p. 502.

39 *Ibidem,* pp. 514-515.



Rem Koolhaas, Bruce Mau, ***S,M,L,XL***, The Monacelli press, New York, 1995



Scotty Cunningham, ***Nude moves block of concrete***, 1966
Image used by Rem Koolhaas to introduce the subject of Bigness
Source: Rem Koolhaas, Bruce Mau, *S,M,L,XL*, 1995, p. 495.

1.3.4. The "Theory of Bigness"

Bigness - not only a theorem, but also a foreword to the chapter L (Large) - debuts with the image of a naked man trying to lift a block of concrete [image]. This photograph is said to metaphorically represent the epopee linked to the architectural conception of "*buildings of colossal size*"[40]. This statement denounces the fact that, although the "*latent theory of Bigness*" has been there since 1978, it is through the design practice as the head of the Office for Metropolitan Architecture that Rem Koolhaas seems to be able to test and formulate his theories. In an interview with John Rajchman, Koolhaas indirectly recognises this fact: "*I have to say that it was actually the practice of architecture - very rarely intellectually stimulating, because of its very difficulty - that gradually imposed a realization upon us: projects like Zeebrugge, the TGB, Karlsruhe, Lille, all had as common denominator a large scale, accumulations not only of one big program but of clusters of diversity, and a political importance that required making very visible statements and changing conditions emphatically. All these were external forces that forced us to realize that "something" was going on. Delirious New York describes the same sort of problem, but in terms of a movement that died, or did not survive the lucidity or clarity or propaganda of Modernism. I was surprised by its return.*"[41]

The acme of Bigness seems indeed to reside in this continuous parallel between the old Manhattan's theories and recent projects of colossal scales. Lamenting the lack of credit lent to Bigness as an *intellectual problem or discipline*, Koolhaas claims that "*only Bigness instigates the regime of complexity that mobilizes the full intelligence of architecture and its related fields*."[42] Thus, beyond the size, Bigness is faced with the innovations it requires due to its extreme complexity. In line with this thinking, Koolhaas recalls the skyscrapers built in New York in the beginning of the twentieth century as the ancestors of Bigness for sharing a similar 'natural' and inevitable occurence: "*The combined effects of these inventions were structures taller and deeper – Bigger – than ever before*"[43]. As much as Manhattanism, Bigness seems to be "*a condition almost without thinkers, a revolution without program*"[44], ultimately a discipline in need of recognition.

Moreover, a social argument is added to the theory (one that was once again implicit in Manhattan's postscriptum), stating that one of the greatest assets of Bigness is the potential of reordering "*the social world*" via "*a vastly richer programmation*"[45]. Koolhaas identifies in the congestion - and in the consequent functional stratification and hybridity - *a recognized social and cultural quality,* and ultimately presents *Delirious New York* as a *"Blueprint for a Culture of Congestion",* declaring himself *"a defender of urbanism as a socio-spatial theory*"[46].

40 Roberto Gargiani, " S,M,L,XL, 1995: principles for a theory of architecture", "Theory of Bigness", in *OMA: The Construction of Merveilles,* EPFL Press, Lausanne, 2008, p. 227.

41 John Rajchman, "Thinking Big", Interview with Rem Koolhaas, in *Artforum*, Dec. 1994.

42 *Ibidem*, p. 497.

43 Rem Koolhaas, *S,M,L,XL, op. cit.,* p. 498.

44 *Ibidem*, p. 498.

45 *Ibid.*, pp. 498-499.

46 Maarten Hajer, "The Generic City", *Theory, Culture & Society –SAGE*, 1999 (pp. 137-144).

1.3.5. The Theorems

The first theorem of Bigness refers to one of the central themes explored by Koolhaas: the fundamental difference between fragmentation and autonomy.

1. "*Beyond a certain critical mass, a building becomes a Big Building. Such a mass can no longer be controlled by a single architectural gesture, or even by any combination of architectural gestures. This impossibility triggers the autonomy of its parts, but that is not the same as the fragmentation; the parts remain committed to the whole.*"[47]

The designation of Automonument that appears systematically associated to the *size issue* in *Delirious New York* (with a very similar introductory assertion) - "*Beyond a certain critical mass each structure becomes a monument, or at least raises that expectation through its size alone, even if the sum or the nature of the individual activities it accommodates does not deserve a monumental expression.*"[48] - is replaced by the simple designation of *Bigness* in *S,M,L,XL*, as suddenly all new references to scale avoid the term 'monument' and, instead, come linked to words like 'large', 'vastness', 'size', 'mass', 'enormity'[49].

Moreover, in the Bigness manifest, the notion of scale is often combined with the term 'Whole'. The term emerges through the denial of the phenomenon of 'fragmentation' that Koolhaas identifies as being recurrent in the contemporary urban trends every time 'functional mix' and 'scale' become central premises; the responses to such premises often result on solutions that are dull, simplistic and thus opposed to the clarity of Bigness: "*All the programmatic hybridizations, proximities, frictions, overlaps, superpositions that are possible in Bigness – in fact, the entire apparatus of montage invented since the beginning of the century to organize relationships between independent parts – are being undone (...) in compositions of almost laughable pedantry and rigidity.*"[50] The choice of the term Whole to designate the intrinsic uniformity of Bigness is not hazardous, for Robert Venturi had already used the term in the 1960s while assessing a knotty trend in the American architecture. Koolhaas advocates now for a reconsideration of the Whole: "*Venturi, in the '60s, was one of the first to sense that "the whole" was becoming problematic, that it is based on a series of denials and repressions. The quality of his book* Complexity and Contradiction in Architecture *was to unleash those repressions. But he called it a "difficult whole," not an "impossible whole,"*[51] and

47 *Ibidem,* p. 499-500.

48 Rem Koolhaas, *Delirious New York, a retro-active manifesto for Manhattan*, *op. cit.*, p. 100.

49 *Ibidem,* pp. 495-516.

50 Rem Koolhaas, *S,M,L,XL, op. cit.*, pp. 506-507.

51 John Rajchman, "Thinking Big - Interview with Rem Koolhaas", Artforum international, December 1994.

in the 1970s and 1980 the Whole underwent a total disintegration, giving place to a fragmented reality.

The interest that Rem Koolhaas seems to address to "the Whole" versus "the fragmentation" is, as mentioned above, driven by a social motivation, as the co-existence of autonomous parts within one building propels the rearrangement of the social life through the diversity of the functions, where ultimately "*programmatic elements react with one another to create new events*"[52] (again an implicit reference to Manhattanism). One could also refer to Koolhaas's first vocation – scriptwriting - to further clarify the principle of Whole: "*If you write a script, you try to stitch episodes together so that, at the end, you have a sort of suspense to a conclusion or a climax. Architecture is very similar: you create a series of spatial moments and find a way to relate them to each other with the same purpose.*"[53] Indeed, in the idea of Whole as in scriptwriting, "the "parts" are no longer arranged into a 'composition' but rather via a 'montage', as explained by Jacques Lucan in *Composition Non-Composition*[54].

The object of the second theorem - the Elevator – is one of the tools that ultimately enables the Whole:

2. "*The elevator – with its potential to establish mechanical rather than architectural connections – and its family related inventions render null and void the classical repertoire of architecture. Issues of composition, scale, proportion, detail are now moot. The "art" of architecture is useless in Bigness.*" [55]

In *Delirious New York*, the elevator is, aside with other technological innovations, described as a 'magic tool' that allows for an endless number of new possibilities in the architectural practice, opening the way for new horizons on the classical architectural vocabulary. The skyscraper ultimately becomes its most radical expression, promoting a new axis of urban growth – the vertical axis - as it allows for a limitless stacking of new virgin lands. However, as the accumulation of functions within a skyscraper increases, some challenges related to the vertical growth start becoming evident. One of them has to do with a detachment between floors – *the schism* – and the other is, as explained in the third theorem, the break between 'container' and 'contained'.

52 Rem Koolhaas, S,M,L,XL, *op. cit.*, p.497.

53 Nick Glass, Rose Hoare, "Koolhaas rewrites scripts with blockbusters buildings", CNN News, Mar. 2012. Source: http://edition.cnn.com/2012/10/02/world/asia/koolhaas-big-pants-cctv/ (20/03/2016).

54 Jacques Lucan, *Composition, Non-Composition – Architecture and theories XIX° & XX° centuries*, *op. cit.*, p. 551.

55 Rem Koolhaas, S,M,L,XL, *op. cit.*, pp. 500-501.

3. "*In Bigness, the distance between core and envelope increases to the point where the façade can no longer reveal what happens inside. The humanist expectation of 'honesty' is doomed: interior and exterior architectures become separates projects; one, dealing with the instability of programmatic and iconographic needs, the other – agent of disinformation – offering the city the apparent stability of an object. Where architecture reveals, Bigness perplexes; Bigness transforms the city from a summation of certainties into an accumulation of mysteries. What you see is no longer what you get.*"[56]

Because of its colossal scale and depth, Bigness operates a disconnection between container and content: façade and program no longer correlate. From an outside perspective, the different programs can no longer be recognized and thus "*the humanist expectation of honesty is doomed*"; entering such buildings would be almost like entering "*an amoral domain*" containing "*an accumulation of mysteries*"[57]. In this matter, Koolhaas adds that "*interior and exterior architectures become separate projects*", a principle that seems to apply to the working methodology of OMA in general, whose first procedural innovation was to release "*the old model of seeing a building as 'one integrated design task'*"[58].

Aside with the idea of disconnection, Koolhaas refers to the unpredictability of Bigness as it encourages the "*promiscuous proliferation of events in a singular container*". Consequently, the only possible response to the unpredictability seems to be 'openness' and 'flexibility' - a sort of *programmatic alchemy*[59] that leads to contamination and intensity sharing among the different programs, allowing them to be connected and yet still be autonomous and independent parts (as seen above in the idea of Whole). Simultaneously, the recognition that, because of its vastness, "*it is simply impossible to animate its entire mass with intention*" may be seen as a relief as some zones will have to be "*left out, free from architecture*"[60]. Again, Bigness is said to intend to remain as abstract as possible, as open and flexible to accommodate unpredictability as possible.

"Bigness or the problem of Large" concludes with the image *Abstract painting 726* by Gerhard Richter that represents "*a subject that has been scraped away, leaving incomprehensible trails of color*"[61]. This image may be representative of the unlimited levels of complexity associated to Bigness and how difficult it is, in the end, to expose them as a clear diagram.

56 Rem Koolhaas, *S,M,L,XL*, op. cit., pp. 500-501.

57 *Ibidem,* pp. 500-501.

58 Bryan Boyer, "Brute Force architecture and its discontent", *ETC,* May 2012. Source: http://etc.ofthiswearesure.com/2012/05/brute-force-architecture/ (13/03/2016).

59 Rem Koolhaas, *S,M,L,XL, op. cit.,* pp. 511-513.

60 *Ibidem*.

61 Roberto Gargiani, *OMA: The Construction of Merveilles, op. cit,* p. 223.

This third theorem claims also to introduce a form of *architectural complexity* that relates directly to the process and its multiple involved parties (and associated interests) and, ultimately, implies the fading of the discipline itself. As explained by Koolhaas, past a certain scale *"the bigger the building the less the architecture. One reason for this (...) is the way inefficiencies and costs are multiplied by size. There are exceptions. But if most large buildings are put up to make investors money, quickly and predictably, lawyers, accountants, developers and clients will optimize repetition and reduce all the multiplying costs that are not strictly necessary."*[62] Nicola Marzot reinforces this idea of procedural complexity by saying: "*The inner complexity of the block is thus the result of engineer, financial, technological and urbanistic competences*" [63]. This idea that architects become simple coordinators of multiple related entities is mentioned in a chapter entitled "Team", where ultimately Koolhaas affirms that Bigness is "*where architecture becomes both most and least architectural*" [64]. Although it remains 'most architectural' because of its colossal size, it is 'least architectural' because of its loss of autonomy: it becomes "*a tool serving other forces*". Koolhaas surrenders to the lack of control that is intrinsic to Bigness but tries to turn it into something positive by saying that Bigness softens the architects' big egos as it becomes pure team work - "*it can be achieved only be giving up control and umbilical cords to other disciplines*"[65].

The final theorems refer to the impact that Bigness has on the city and contain some of the most polemical observations affirmed by Koolhaas. In the forth theorem, Koolhaas claims that Bigness can no longer be judged regarding its architectural quality.

4. "*Through size alone, such buildings enter an amoral domain, beyond good or bad. Their impact is independent of their quality*"[66].

Finally, the last theorem embodies the fundamental conclusion of the manifesto: Bigness becomes an exception on its multiple related subjects and, ultimately, it neglects the context.

5. "*Together all these breaks – with scale, with architectural composition, with tradition, with ethics – imply the final, most radical break: Bigness is no longer part of any urban tissue. It exists; at most, it coexists. Its subtext is fuck context*"[67].

62 *Ibidem.*

63 Nicola Marzot, "The Net-city/Clusterization and the urban block", *op. cit.*, p. 219.

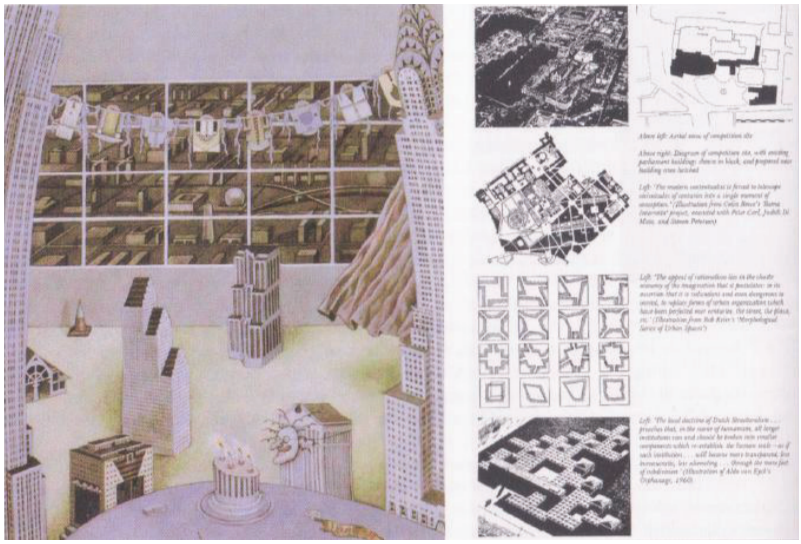
64 Rem Koolhaas, *S,M,L,XL,* op. cit., pp. 513-514.

65 *Ibidem.*

66 *Ibidem,* pp. 501-502.

67 Rem Koolhaas, *S,M,L,XL,* op. cit., pp. 502-503.

«Life in the Metropolis or The culture of Congestion», and «The Discovery of Manhattanism».
Source: *Architectural Design*, 1977 (an issue dedicated to OMA).



Madelon Vrisendorp/OMA, *Dix ans après l'amour*, 1984.
Page from the essay of Rem Koolhaas/OMA, «OMA. Urban invention», published in *InternationalArchitect*, 1980.

Although in his introduction to Bigness, Rem Koolhaas claims that the theorems were latent in Delirious New York, Roberto Gargiani notices that this fith theorem appears for the first time only in Bigness "*In 1991 Koolhaas had pointed to the existence, in Delirious New York, of four "themes" or "characteristics", while in Bigness (...) he added a fifth theme (...) leading to the final, most radical break: 'Bigness is no longer part of any urban tissue*[68]*'*"[69]. Bigness is, in the end, Architecture versus Urbanism.

1.3.6. Bigness: Architecture vs. Urbanism

The Bigness manifesto resolves with a chapter entitled "Bastion", and it is here that Rem Koolhaas unveils his vision for the city after Bigness, with a statement that seems to contain an implicit (and somewhat provocative) allusion to Le Corbusier's critical vision over the 'residual street', or even a revival of the praise for the *tabula rasa* condition: *"Bigness transforms architecture. Its accumulation generates a new kind of city. The street is residue, organizational device; Bigness can exist anywhere on that plane. Not only is Bigness incapable of establishing relationships with the classical city, it is itself urban in the quantity and the complexity it offers. It competes with the city, it represents the city, it is the city*."[70]

This conclusive approach to Bigness could also be seen as a preparation for a more radical essay published also in *S,M,L,XL*. The "Generic City"[71] essay goes beyond Bigness as it reaches a larger urban scale and breaks with any historical/real/contextual reference, mentioning the traditional city as an 'island' with a particular character or identity, a form of self-contained urbanism that is 'just another element' within the context of 'urban islands' formed by the multiplication of Big Buildings that "*gravitate opportunistically around location of maximum infrastructure promise*"[72]. It is here, as enhanced by Roberto Gargiani, that "*the concepts of 'fuck context', 'Bigness=urbanism vs. architecture', 'post architectural landscape' and 'continuous metropolitan plane' constitute the premises, in S,M,L,XL, for an autobiographical, synthetic vision of human settlements in the world: the Generic City*."[73] Moreover, Koolhaas claims that this form of multiplication and juxtaposition of 'self-contained' cities could paradoxically be the only possible way to counteract the effects of globalization.

68 Rem Koolhaas, *S,M,L,XL,* op. cit., pp. 502-503.

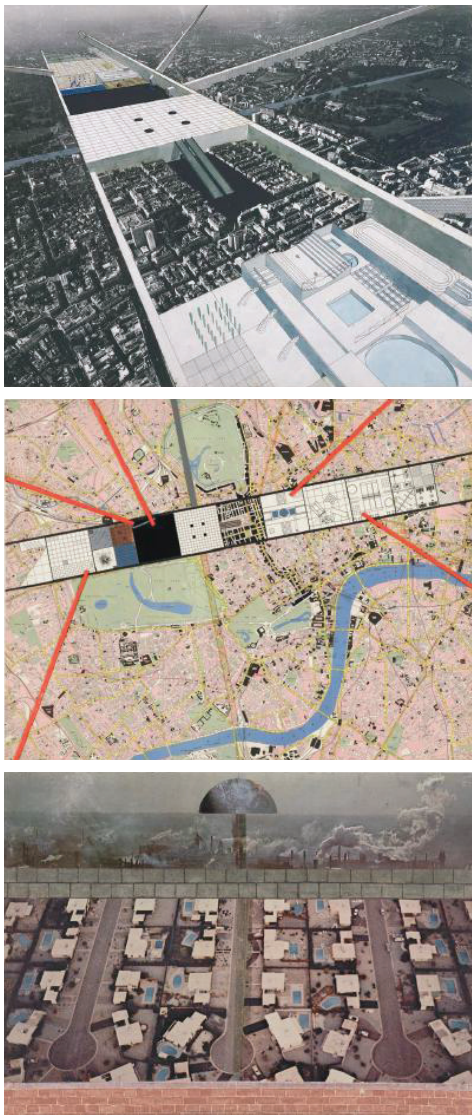
69 Roberto Gargiani, " S,M,L,XL, 1995: principles for a theory of architecture", "Theory of Bigness", in *OMA: The Construction of Merveilles, op. cit,,* pp. 227-228.

70 Rem Koolhaas, *S,M,L,XL, op. cit.,* p. 515.

71 *Ibidem,* pp. 1238-1269.

72 Rem Koolhaas, *S,M,L,XL, op. cit.,* p. 515.

73 Roberto Gargiani, *OMA: The Construction of Merveilles, op. cit,* pp. 223-227.



Rem Koolhaas, Elia Zenghelis, Madelon Vriesendorp, Zoe Zenghelis, Exodus, 1972

Source: *Perfect Acts of Architecture*, 2002.

This concept of 'multiplied urban islands' could recall the project "The City in the City - Berlin: A Green Archipelago", developed in collaboration with Oswald Mathias Ungers and a collective of architects in 1977 and implicit in Rem Koolhaas essay "Imagining nothingness" in 1985: "*Through the parallel actions of reconstruction and destruction, such a city becomes an archipelago of architectural islands floating in a post-architectural landscape of erasure where what once was a city is now a highly charged nothingness.*"[74] Simultaneously, the concept of self-contained city could relate to Rem Koolhaas's early project and thesis "Exodus or the Voluntary Prisoners of Architecture" (1972). In this project [image], Koolhaas proposes a way-out to the nauseous context of London by building a 'desirable walled city', within the city itself, where residents become the voluntary prisoners of architecture. Bigness could be interpreted in a similar way, as the buildings claim to embody 'cities' within their envelopes, becoming a "*completely enveloping reality and an absolute autonomy*"[75]. But beyond that, Bigness is implicitly depicted as another desirable (almost ideal) walled city that remains safe from any form of contamination: "*It is an alternative world. Inside Bigness is a program of the classical city that has been aestheticized, cleaned up, made safe, varnished, and ultimately impoverished. It proposes a 'germfree' world that is not contaminated by the same social ills of the world outside.*"[76]

Yet what happens inside Bigness?

Although a lot has been written on the subject of Bigness and its relation (or non-relation) with the classical city, the references to what happens inside Bigness are rare and abstract. They relate to a form of *unpredictable chaos* (comparable to the one of the historical city) or to a whole new universe of social events that is likely to proliferate inside the envelope of Bigness as a "walled city".

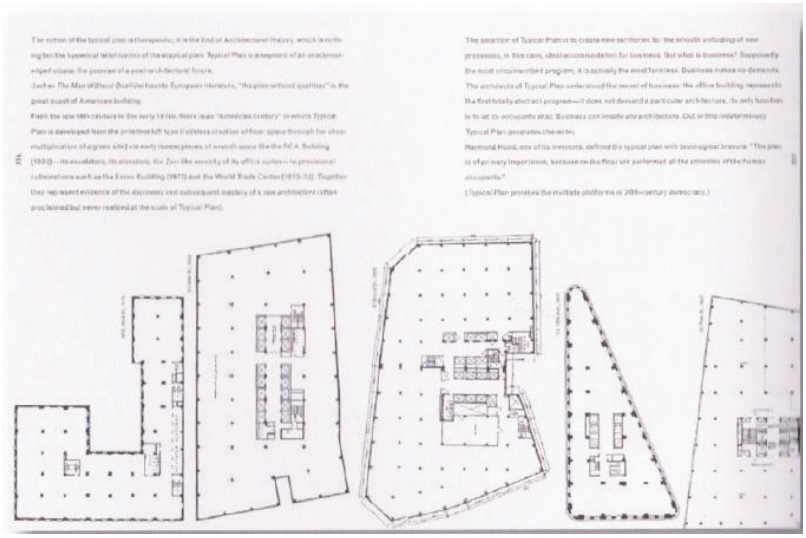
By being able to merge together multiple volumes and programs that establish a certain form of consistency and fluidity, Bigness is said to embody a revival of the wholeness of the architecture form, the "Whole" that had once been lost. The concept is said to be reincarnated on the idea of "skyscraper complex" that immediately recalls the agglomerations of several skyscrapers forming a new whole as per the images of Hugh Ferris published in Delirious New York. "*Instead of separation, the skyscraper complex creates continuity (...). For the city (...) it is not merely the imposition of a huge parasite but (...) a new condition, a new way of receiving the public.*"[77] This idea of merging different volumes bears an almost direct allusion to the project of the CCTV headquarters, a project that suggests

74 Rem Koolhaas, "Imagining nothingness", an essay written during his studies at the Architectural Association, 1985. Available online: http://th3.fr/imagesThemes/docs/Rem_Koolhaas.pdf?PHPSESSID=fvtkroupr85hv7al26dvbf2a85 (20/04/2016).

75 Jorge Otero-Pailos, "Bigness in context: some regressive tendencies in Rem Koolhaas' urban theory", *City: analysis of urban trends, culture, theory, policy, action*, 2000, pp. 379-389.

76 *Ibidem.*

77 "OMA, Studio per un grattacielo", *Domus*, 1998, n° 800, p.51.



Double page from the *Typical Plan*.
Source: Rem Koolhaas, Bruce Mau, *S,M,L,XL*, 1995, **p. 344-345**.

a transformation of a group of 4 independent skyscrapers into a single form with a continuous loop that applies not only to its exterior shape but also to its inside events: "*a building that asserts that the company is a connector, where everyone is connected to everyone else, and each component part of a single hierarchy and a single integrated system*"[78].

If the references to the inside of Bigness are rare, the references to the subject of housing or collective living could only implicitly relate to the essay "Typical plan. Meditation"[79]. In *Delirious New York* there was already a chapter named "Typical Plan" that descibred the neutrality of the 1950s office towers: "*neutral, abstract, austere, sufficiently indefinite, 'as empty as possible' and contrasts with the Atypical Plan which has characteristics, instead, of uniqueness and individuality*."[80] Koolhaas writes that the shape of the Typical Plan should be the one of a rectangle because "*it is the most generic*"[81] and eventually the most efficient one to eventually receive housing (one could guess). Ultimately, as mentioned by Roberto Gargiani, "*a crucial consequence of Bigness on the scale of the city is the disappearance of the logic of the urban plan, replaced by an accumulation of Bigness, a Piranesian pile-up of grand buildings on a surface conceived as an undivided platform or neutral plane on a metropolitan scale*".[82] In the meantime, it is certain that nearly every housing tower that has been built since then obeys to a 'typical plan' that is repeated in height for the sake of efficiency. Simultaneously, this could implicitly mean that, inside Bigness, there's not only space for the simultaneity of programs but also to inpredictability or future transformation - offices could be turned into housing - or any other program that could come and occupy a part of the "Piranesian pile-up".

1.3.7. Outcomes of Bigness

If on the one hand, as emphasized by Antonio Negri, Bigness bears an undisputable contribution to today's architectural thinking – "*Bigness and Delirious New York are basic texts for reading and critiquing architecture today*" – on the other hand, Rem Koolhaas's approach is often criticized for being haughty as it focuses on a 'self-sufficient architecture' – "*a contraction, a hyper-architecture*" as proclaimed in "Bastion" the conclusive chapter of S,M,L,XL. This acclamation of the Big Building as a "city island" that functions independently from its context reveals indeed an unresponsive approach to the context or the public realm. It is certain that architecture and urbanism need to evolve and eventually mutate into new models, yet it is important to highlight that this form of refutation of the public realm must be questioned and other alternative approaches must be introduced into the theoretical reflection. And indeed, the famous and once provocative "*Fuck context*" of Koolhaas is already being questioned by a new generation of architects

78 Nick Glass, Rose Hoare, "Koolhaas rewrites scripts with blockbusters buildings", *CNN News*, March 2012.

79 Rem Koolhaas, *S,M,L,XL, op. cit.,* pp. 335-346.

80 *Ibidem.*

81 *Ibid.*

82 *Ibidem.*

«Fuck Concepts! CONTEXT!» - San Rocco Magazine Issue No. 4, 2012
Source: http://www.sanrocco.info.

who develop the subject through a sort of skeptical approach, as implicit in the title of the issue of the architectural theory magazine *San Rocco*: "*Fuck concept. Context!*"[83] [image].

On the other hand, though, it is important to acknowledge that, in the last couple of years, the impact of Bigness in the city has become more noticeable than ever. Peter Davey states that Bigness has indeed become a tendency since the Industrial Revolution: "*Bigness is inescapable. Since the beginning of the Industrial Revolution, civilization has been inexorably set on a course to increasing size, bigger cities, bigger transport networks, bigger corporations (...) with a hope of success in the global market.*"[84] In a globalized context, it becomes therefore clear that the competition between cities is often done through the realization of huge iconic buildings that gradually erase the urban grain and its public realm, often assuming the role of marketing instruments at the service of the territorial economy, a fact that, as stated by Nicola Marzot, is "*partially powered by the local market and more intensively by the international one*"[85].

The public realm remains indeed a matter of central importance, as per what is suggested by Koolhaas in the description of the project of the *Très Grande Bibliothèque* in Paris (1989): "*I find that one of the most pregnant and provocative elements of the library program in Paris was to re-formulate the idea of a "communal facility", an "entity" in the midst of a complete collapse of the public realm—and certainly of its classical appearance.*"[86]. If we have seen earlier, while analysing the approach of the Team 10, that the inclusion of public space and communal areas within large-scale buildings was a central subject, within Bigness, the character of the public space is forced to change and this has to do with the fact that the Big Building is an object made of enclosed boundaries; although some of its spaces could be accessed by external users, and although the inclusion of public areas is normally one of the central initial premises of most Big Buildings, these spaces are never quite comparable to the public spaces of the cities; they are forced to have secured gates and are normally owned by private entities.

83 "Fuck concepts! Context!", *San Rocco* n°4, 2012.

84 Peter Davey, "Bigness", *Architectural review*, nº 212, 2002, pp. 32–33.

85 Nicola Marzot, "The Net-city/Clusterization and the urban block", p. 217.

86 Rem Koolhas, cited in Jorge Otero-Pailos, "Bigness in context: some regressive tendencies in Rem Koolhaas' urban theory", *op. cit.,* pp. 379-389.

1.4. Mind the Gap!
Between relational complexity and the complexity of Bigness

The first approach to *architectural complexity* we have analyzed – the *relational complexity* proclaimed by the Team 10 – focused on the subject of collective housing and on the idea of exploring not only the inner qualities of the dwelling but also, and principally, on the comprehension of the true meaning of *living in community* – a concept that, due to the inescapable densification of the urban territory, had been transferred from the traditional street-house scheme to the collective housing building. Their aim was therefore to preserve the fundamental qualities of the urban life within schemes that were much larger and much denser than the precedent collective housing models, and mainly exploring the concepts of *connection, articulation, flux, community life*.

The second approach to complexity that we have explored – Rem Koolhaas's approach to *scale and complexity* and, ultimately, *procedural complexity* – epitomizes the inaugural theorization of our study object: the actual concept of *Bigness* and *Big Building*. It focuses on the subject of *scale* as a fundamental challenge to the architects, demanding for it to be considered as a central design premise, aside with form and function. The outstanding scale of Bigness is also said to subvert the traditional role of the architect – Rem Koolhaas claims that scale, on its own, increases the complexity of the project dramatically. The "regime of complexity" associated to Bigness is triggered by the "*accumulation of technological, engineering, urbanistic and financial expertise favored by Bigness*"[1]. Koolhaas also claims that the scale of the building transforms it into an exceptional object – an *automonument* – that can no longer aim to articulate with any urban fabric. With *Delirious New York*, Koolhaas has indeed produced a sort of anti-Corbusian reading of the complexity of the American city. One could superficially interpret Koolhaas's celebration of the city's disorder and verticality as a passive acceptance of these conditions; yet Koolhaas is everything but passive. Instead, his intent is to systematically incorporate these elements of the American city into the European and Global design culture, following the line of the Team Ten's revisionist proposals and assumed radical form in the late 1960s, when the criticism of modernism has turned into a political alternative.

Whereas for the Team 10, the horizontality had a key potential to trigger social life, the vertical staggering of floors and disparate functions has come to be a key tactic for Koolhaas, for he had understood its vital role on the revitalization of American business centers. Yet although this approach bears close resemblance to the idea of the *polycentric city* – the ones we have described earlier, proposed by the Team Ten – its similarity to the urban tradition informing historic city centers is colored by its tree-dimensional spatial mechanics. Within the new skyscraper, "*three overlaid structures – public, private and mechanical – define a self-sufficient vertical organizational system that tends to break down centrality into dispersed points"*[2].

1 Roberto Gargiani, Oma The Construction of Merveilles, *op. cit.,* p. 227.

2 See Inaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to*

	The Relational Approach **Alison & Peter Smithson + Team 10**	**Bigness and Complexity** **Rem Koolhaas**
The Context and the Relation with the city	Inclusive, Adaptative - the building tries to merge with the city fabric Golden Lane streets in the air system, Berlin Haupstadt, Frankfurt, Le Corbusier's Venice Hospital	Excludes the context - the Big Building 'competes with the city' - never articulates.
The deployment axis	The social potential of the horizontal deployment (as the movements on the street have always been horizontal)	Bigness seems to nurture from the evidence of Manhattan and form the efficiency of the vertical stacking of functions
Connection/ Articulation	Intends to be an articulated and connected system. 'Stem', 'Web', Network, Flux	the linkage of floors via elevator provokes schism. there's no relation between floors.
Iconicity	Avoids iconicity - intends to merge with the urban fabric	assumes itself as an 'automonument'; monumentality is an intrinsic condition
Housing	Central subject - the 'doorstep philosophy' the house looks to the interior and to the outside space simultaneously - the importance of the access 'street' as a social space	Secondary subject - typical floor plans; repetition, speculative models. No reference to the housing Subject in Rem Koolhaas's speech.
The design process	The architect as the author	The architect becomes a coordinator with reduced power, depending on other disciplines and forces
Complexity	Intends to be the physical represetation of complexity as a system of articulated elements. Disregards the complexity of the process - financed mainly by public entities	Focuses on the complexity that derives from the exceptional scale of the building - the multiplication of actors and loss of power of the architect Disregards the complexity of the design - architectural models become speculative and simplistic

Comparative analysis of the two approaches.

If on the one hand the approach of Team 10 seems in some ways to be too idealistic and has found little application on real projects (the *mat building,* for instance, would probably be hard to apply to a housing scheme), on the other hand, Rem Koolhaas's approach seems in many ways to be very simplistic, as a sort of surrender to the external forces and using such justification as a way to explain a certain haughtiness of the Big Building towards the city, with no effort to articulate with the urban fabric.

Upon closer examination of the two models of architectural complexity described above, it becomes evident that, despite departing from a similar query – the conception of a model of architectural/urban densification/intensification opposed to the principles of modern urbanism – the two undertake very different (in many points opposed) approaches. Some particular differences must be acknowledged in what relates to:

a) the context – the first approach (relational complexity) tries to articulate the building with the surrounding city fabric, aiming even to merge the structure of the building with the one of the city (see above the references to the *deck*, the *stem*, the *cluster*); the second one neglects the context – stating peremptorily that the size of the Bigness is the one of a city on its own (and no longer the scale of a building that can aim to connect with the city);
b) the deployment axis – the first model values the horizontal connection and its social potential (as the movements on the street have always been horizontal); Bigness seems to nurture from the evidence of Manhattan and form the efficiency of the vertical stacking of functions, accepting the inherent condition of schism between floors provoked by the circulation via elevator;
c) the built form – whereas the first model envisions the creation of buildings that are idealized as flexible and potentially growing networks, the model of Bigness refers mostly to sharp compact envelopes that may eventually become containers for 'wild' inner dynamics;
d) housing – the Team 10 has focused on the production of quality housing schemes, from the street space to the actual home space; Koolhaas does only very superficial references to the interior of the building and takes the idea of 'typical plan' (also nurtured on the American culture) as a given parameter (Koolhaas does almost not reference to housing);
e) the building character – the first approach focuses on the social qualities of the buildings (most of them financed by the estate) whereas the second approach is mostly a result of speculation and globalization (mostly financed by private investors or public-private partnerships);
f) complexity – the Team 10's aim is to reintroduce architectural complexity (opposing the extreme simplification, standardization and monofunctionality of the schemes endorsed by modernism), seeing complexity as a quality of the architectural and urban life; Rem Koolhaas refers to complexity as a major difficulty that the architect has to deal

contemporary practice, MA: MIT Press, Cambridge, 2003, pp 254-257.

with, aside with the weakened role of the architect as planner (very often smashed by the intents of the investors).

Although the two approaches described above raise relevant thoughts and observations to nurture our research, we cannot prevent ourselves from stressing three fundamental points that require further investigation:

a) the 'gap' that arises from the comparison of the two approaches must be highlighted: the first one relates to the actual features of the buildings and to the conditions of social living; the second refers to the Big Building on a very abstract and detached approach, stating that the challenges related to the process undermine the architect's control over the design (with an undertone of surrender);

b) it is important to understand whether the procedural complexity undermines the possibility of conceiving a sensible and humane architectural/ urban design;

c) the two above-mentioned theories bear a superficial approach to the subject of housing in terms of the typological diversity or the configuration of the dwelling units. On the one hand, the Team 10 claims to focus on housing as their central theme (mainly the communal/relational aspects of housing) and yet one of their most promising models/theories – the *mat building* – hasn't applied to the design conception of housing buildings. On the other hand, Rem Koolhaas does not refer to the subject nor includes any particular thought on the subject of habitat or community living on his writings.

Our research will, henceforward, focus on the gap that lies between the two approaches. We will raise the hypothesis that, despite the complexity associated to the conception of Big Buildings (extra-large built envelopes housing a large variety of programs including housing), it is still possible, on the one hand, to conceive buildings that connect with its urban context and create real bonds with the city, and, on the other hand, to conceive housing schemes bearing architectural quality, innovation and social engagement. We will also try to investigate whether the constraints implied on the challenges of conceiving a 'city within a building' can still allow for the creation of innovative articulated systems of multiple different uses and conditions, highlighting the connection of habitat to other programs.

In the next chapter, we will deepen our exploration of the subject design complexity by tackling the Big Building's fundamental conditions: density, functional mix and typological/social mix. These will be illustrated by means of a selection of exemplary buildings – both historical and recent – interposed with applicable theoretical contents.

1. In a first moment, we will focus on the concept of urban/architectural *Density*. The Big Building embodies a double and intensified condition of density. Firstly, it is a model of compaction that results partly from the guidelines of the Sustainable Planning – the plea for congestion and functional mix against the zoning strategies and the resulting model of 'city within the city'. Secondly, the Big Building

epitomizes the challenge of planning multiple different programs within the compaction of a bounded architectural object; we will thus explore the potentials of *density* – focusing on the seductive side of density (rather than spatial scarcity) as a generator of architectural innovation and inventiveness, both in what relates to program mix and housing.

2. In a second moment, we will verify the issues implied in the condition of the Big Building as a container of *Functional Mix*. Are the effects of *functional mix* planned inside the Big Building comparable to the ones of *urban diversity*? We will analyse aspects such as the articulation of building and city (the public/semi-public spaces of the Big Building and the public space of the city), the potential inner 'urban' logics triggered by the building's internal circulation system linking the different uses and, finally, the eventual dynamics created between the living, working and recreational areas within the building.

3. Finally, in a third moment, we will explore the potentials of the Big Building as a possible container and booster of *Typological Mix* (focusing particularly on the planning of housing). Departing from the assumption that the Big Building is a 'self-contained city'/'a city within the city', the base idea of social mix could also be expected to appear therein. We will see that Le Corbusier has taken this principle as a given when he designed the *Unité d'Habitation*. Nonetheless, the idealistic beliefs of modernism have led him to reduce social variety to a very restricted range of 'standard' family types. Yet, recently, many other architects have taken this model as base and reworked inventive housing schemes bearing a more intensified typological variety, more coherent with today's heterogeneous and changeable society. Our selection of buildings bearing this typological mix has scale, object and resemblance with the *Unité d'Habitation*'s model as base principles, representing potentially interesting references for the planning of typological density inside the Big Building.

What we will seek to understand in the next chapter is whether the current production of Big Buildings, as well as the housing types it contains, can be tackled through a wealthier architectural complexity despite the inherent and unavoidable complexity of the process. In that sense, we will try to decompose the Big Building into its fundamental conditions and have a particular stare into each one, trying to keep a fundamental focus on the subject of housing, while looking simultaneously inward to the dwelling space and outward to the circulation/articulation/common space of the building.

02
Density and Functional Mix

Density and Functional Mix

2.1. Density
Introduction

Throughout our analysis, we will verify that, within the Big Building, the concepts of *Density* and *Diversity/Mix* remain steadily interconnected. It is indeed the Big Building's particular condition of compaction and high density that forces space to accommodate different functions with hyper-efficiency, to the point of *mixing and overlapping multiple different uses*[1]. Taken to its extreme, this generates a building of exceptional dimensions, which is often *refitted in its shape to accommodate an extensive and unusual mix of uses and users*[2]. The Big Building is generally implemented in a context of urban density itself, becoming a new cluster and a catalyst for a determined city area, which is partly the reason why most of the Big Buildings are designed to bear day-and-night activity and a constant flux of public. In some cases, people are offered the possibility to live, work and spend part of their spare time inside the same building - which ultimately turns the building into a container for a small city; a city within a city, active all day long. The confrontation and the proximity of different functions triggers continuous activity within one place and increases exchanges and proximity between the users of multiple kinds, which ultimately results on a certain form of urbanity that goes beyond the mere concept of collective living.

This helps us to clarify the limits of our research and, principally, to clearly distinguish our research subject - housing in the Big Building (density with the mix of uses and/or typologies; ultimately, density with complexity) - from the very different subject of large-scale collective housing buildings (density with repetition). Both have large scale as their quintessential condition and they're often mistakenly set in the same category, but the two types bear clear differences in many aspects. Aurora Fernández reinforces this idea: "*In the search for models capable of economizing on resources, Hybrid Buildings, especially those with residential uses, are specimens of opportunity which have the gene of mixed use development embedded deep into their gene code, a gene which is vital in order to adapt to the trends of the times. Nevertheless, this mixed condition brings them to be mistakenly compared to another avant-garde model, a model which despite at first seeming to be its predecessor, the truth is quite the opposite. We are of course referring to the Social Condenser*"[3].

1 About the "mixing and overlapping of uses", see Mary-Ann Ray, Roger Sherman, Mirko Zardini, *The Dense-city, Dopo la dispersione - After the Sprawl*, Electa, Milan, 1999.

2 Indeed, the Big Building no longer represents an archetypal type of building; it is a 'relational container' where form and function no longer correlate, and where it is no longer possible to control the proliferation of its inner events

3 In the book *This is Hybrid*, Aurora Fernández Per establishes a similar distinction, defining two different groups of buildings: the social condensers (large scale collective housing buildings that host housing and a small number of common facilities) and the hybrid buildings. In this book, the *Unité d'Habitation* is categorized as a Social Condenser (mostly because of its inspiration in Moisei Ginzburg's Narkomfin building); we disagree with this classification and we will explain why in the following pages, when we focus on the analysis of the building. See Aurora Fernández Per, "hybrid versus social condenser", in a+*t* research group (Aurora Fernández Per, Javier Mozas, Javier Arpa), *This is Hybrid*, a+t, Vitoria-Gasteiz, 2014, pp. 42-75.

Yet, the distinction between the two models is not only determined by the condition of functional hybridity, but it is also particularly remarkable in what relates to the form of density. Although both models may represent paradigms of hyper-density (considering the ratio of total built surface per surface of the plot), the density of the inner spaces (namely the one of the dwelling units) is generally very different. Indeed, large-scale collective housing buildings seek mainly for the efficiency of the plan (in terms of use and cost), hosting dwellings of rather minimal dimensions (mostly social housing), with standardized floor plans. The Big Building is quite different in that matter; the density of the inner space adapts to the accommodation of different uses and the dwellings planed therein correspond, in most cases, to medium/high-standard dwelling typologies. Another remarkable difference between the two is the context: whereas the first type is normally located in suburban low-density contexts, the Big Building is set in a context of high urban density (the city center), normally occupying the place of old industrial sites with privileged central positions.

We believe, therefore, that a comprehensive and articulated theoretical analysis of the subjects Density and Diversity/Mix will be of a structuring importance to withstand our research on the Big Building's complex design strategies. We will proceed with a scrutiny of the concept of Density and the Big Building, followed by an articulation with the subject Diversity/Mix – which will focus, in a first moment, on the analysis of the functional mix and then on the exploration of typological/social mix[4].

It is undeniable that the Big Building can easily become a container for several different forms of density and mix[5] – which are not necessarily controlled or planned in the initial design scheme, and yet are likely to proliferate within its internal space. But what kind of strategies can be applied to the architectural design in order to, on the one hand, incite the advent of interesting functional and social interrelations[6] and, on the other hand, leave space for the unpredictable? How can housing, as a program, fit within this model? Can we expect to find, within the Big Building, a new thrilling platform for the everyday life? [7]

4 As we've learnt from the theories of *complex thinking,* explored in the previous chapter, it is fundamental to be able to decompose large complex systems into small elementary parts in order to make them understandable. We will see, indeed, that often the most basic forms of density and functional mix (as, for instance, the shop-house model) are the ones where the issues and subtleties can be identified and understood more effectively – ultimately becoming assets to nurture the conception of the Big Building. This part of the theoretical research will therefore not be restrained only to Big Buildings, but will rather track buildings where density, functional hybridity and/or social mix may bear particularly relevant challenges, successful outcomes or recognized potentials.

5 'Mix' can refer to several different strategies within the Big Building. As mentioned above, it can relate do the mix of functions, to social mix or to typological mix. We will illustrate those different forms of mix through examples of buildings where these have been applied, and we will also refer to buildings that can bear, at once, containers for multiple and simultaneous forms of mixing.

6 The act of linking different programs involves a variety of complex architectural features, able to provide a successful and unproblematic articulation between different uses and users.

7 What is particularly challenging in a programmatic mix is to successfully organize these functions of different types, that can go from the most public to the most private; this question is raised mainly when housing - the most intimate and demanding of all programs - is part of the mixed use system.

2.1.1. General definitions

Density is a relatively ambiguous term, to some extent due to the multiplicity of disciplines using it or referring to it simultaneously, yet with different definitions and applied to different phenomena.

Long before having been used in architecture and urbanism, the term density has been used in science. Within scientific domains, one can indeed define and calculate density quite precisely, within conditions that allow a stable consensus over the data in use; for instance, *the thickness of a solid, liquid or gas being measured by its mass per unit of volume*[1].

As the notion has expanded to the field of social sciences, the term density has automatically been added of a higher level of uncertainty and heterogeneity[2]. Indeed, although increasingly globalized, our society remains largely defined by diversity, heterogeneity and by its changeable character, and hence one must keep in mind that the density calculations used to measure the society - human beings or the sensible world – are subjected to a high level of ambiguity and uncertainty. For this reason, more than seeking precision, these definitions of density are used as *forms of comparison in between similar or analogue social conditions*[3].

As much as in social sciences, within the disciplines of architecture and urbanism the concept of density isn't easy to define, as its indicators vary constantly according to social and cultural factors, even with time and scale, and most of them can only be quantified by means of sensorial approaches. In architecture, density can be simultaneously seen as a form of measurement – e.g. built surface per unit of territory[4] – or as a qualitative value (e.g. "this space feels dense")[5].

1 Definition in Oxford Advanced Learner's Dictionary, 2005.

2 The concept of density isn't perceived or defined identically by an inhabitant of New York, Hong Kong or Lausanne, who are faced with completely opposed social and built conditions. Simultaneously, different personal backgrounds shaped by different cultural environments, make different individuals have singular forms of perceiving that density.

3 In socioeconomics, in "*highly urbanized areas, the fear is that economic density and population density may not coincide*." in *World Development Report*, 2009, p. 49.

4 Nicolas Bassand, « Densité et logement collectif », *Tracés* nº 21, november 2009, p. 23.

5 Within the Complex Design research group, after taking into consideration the ensemble of definitions, the term 'density' has been defined as *the quantity and quality of simultaneous spaces and uses available in a given frame.* In October 2013, the Complex Design group has gathered during a week for the PAGE2 (*penser à grande échèlle*) workshop. The final exercise of this workshop week was the conception of a lexicon - the *CompleXique* - seeking the elaboration of definitions for each of the key-terms to be used by the ensemble of researchers: Nathalie Adank, Aurélie Blanchard, Marta Brandao, Marlène Leroux, Mathieu Mercuriali, Fiona Pia, Nelson Vera. Although there hasn't been an official publication of this document, this document has been an important working tool to sustain the coherence of the researches developed by the different team members.

Having evolved along with the changeable social, economical and urban conditions throughout the twentieth century, the concept of density has become increasingly complex. It has departed from objective definitions - deriving uniquely from numbers - and evolved towards new definitions that refer to more sensitive extents. Since the late 1960s, an approach to density related to numbers has progressively been enriched with a «sensitive approach», a contribution brought to scene by fundamental researchers in urban sciences. Rapoport's works and simultaneous approaches to the topics of density and complexity[6] are particularly interesting, as these connect spatial complexity (under the term ambiguity) with individual perception, claiming that "*humans prefer ambiguous complex patterns in their visual fields*"[7].

One should highlight the importance of establishing links between different fields/ disciplines considering the query of density. In reality, density often acquires a multidisciplinary dimension that lays somewhere in between geography and sociology/anthropology, urbanism, economy or architecture. Densities of population, of services, of circulation, of built forms, are put in permanent and strong coexistence within the urban environment. The paths and bridges between these densities are of great importance and we often evoke the outcomes of the connections. The history of measured density reveals that the built density is not the only one to be measured, but one tends to mix within the same analysis different density values that can translate the constant exchanges between the practices of urban planning.

2.1.2. How to measure density in architecture?

We would like to be able to say that density, in architecture, can be calculated through a simple and unchangeable formula, like in physics - but that's unfortunately not the case. There are multiple formulas and an endless number of parameters directly influencing the calculation of built density[8].

In geography and urbanism, density, as a measurement tool, is calculated through a ratio between the number of inhabitants and a given surface unit[9] - normally

6 Amos Rapoport, Ron Hawkes, "The perception of urban complexity", *AIP Journal*, 1970

7 Amos Rapoport, Robert Kantor, "Complexity and ambiguity in environmental Design", *AIP Journal*, 1967.

8 "*Density (specifically referring to the density of urban space) has numerous definitions and methods of measurement. When we talk about density, we may define it by how many people live in an area, the size of buildings on a given site (floor area ratio or FAR) or how many homes are in an area (dwelling unit density). The lack of a universal means of measurement creates some . In addition to the lack of a universal measurement, vague definitions are also commonly used, also creating confusion. "High, medium and low" degrees of density will vary significantly both in the way they are measured (FAR? Dwelling units?) and in the level of measurement (30 DUs per acre may be "high" in one context and "medium" or "low" in another).*" See more in http://densityatlas.org/

9 Jacques Levy, Michel Lussault, *Dictionnaire de la Géographie et de l'espace des sociétés*, Editions Belin, Paris, 2013.

the hectare – generating a comparative value to quantify the built index of a given place. Yet, in architecture, the calculation methods can be done through different formulas, like the total-built-area by the surface of the plot, or the number-of-dwellings by the surface of the plot, and the calculation methods can even be different from country to country, or even amidst different regions within the same country.

Recent approaches, like the one sustained in the publication 'Why Density?' consider the 'city-block' as the real fundamental scale that matters as we talk of architectural density, suggesting a more flexible approach to density - to include functional and temporal parameters. "*In the scales of Density, from the territorial, to the dwelling scale, the intermediate scale, the urban block, is the main field of activity of the architect. No longer are dwellings per hectare an indicator of Density. We have given up considering Density as a ratio between the number-of-dwellings and the surface of the plot. For us, this has been an important change in our thinking. Along with building-life cycle, different movements can be produced between residential uses, offices and commercial spaces. Uses can change. This should be possible and desirable*"[10].

2.1.3. Density – different actors / different perspectives

Aside with the ambiguity that involves the definition and calculation of density, different actors with different interests, can bear different - and often contradictory - standpoints on the topic of density. In politics, the idea that higher densities of housing are needed is dominant, so that the urban sprawl becomes possible to be controlled and that the principles of sustainable design can be respected. Developers, on their side, are normally keen to densify in order to achieve higher profits (getting the highest possible number of dwellings for sale and more competitive prices). Architects, on their side, are normally motivated to find solutions to the challenges raised by density - planning quality spaces within less surface - and are normally keen to turn difficulties into assets. The population is normally the more reactive group and also the least enthusiastic about the idea of density - immediately associating 'density' to smaller living spaces with less quality. In the end, it is not that difficult to understand that opinions around the idea of strong densities can be diverse and often paradoxical and that a careful work on communication shall be developed in order to change the negative connotation that density bears amidst common sense: "*des gares, de la densité, des éoliennes, oui. Mais pas près de chez moi, pas dans ma nature, not in my backyard. (…) Le refus de plus grande proximité peut s'expliquer parce que l'on confond trop fréquemment concentration et densité...*"[11].

10 Aurora Fernandez Per, Javier Mozas, Alex Ollero, Aitor Deza, *Why density?*, a+t, Vitoria-Gasteiz, Spain, 2015, p. 54.

11 David Mangin, *La ville franchisée: formes et structures de la ville contemporaine*, Paris : Editions de la Villette, 2004, p. 341.

2.1.4. Density: from a negative connotation to a strategic approach

High density indices have always carried out a negative connotation in the collective imaginary[12], for often being associated to forms of density that evolved into social problems[13], like the grands ensembles or the insalubrious city centres of the nineteenth century[14] - "*(…) les indices de densité élevées restent mal perçus dans l'imaginaire collectif, étant régulièrement apparentés à la monotonie carcérale des Grands Ensembles d'après-guerre ou à l'insalubrité mortifère de certaines grandes villes du dix-neuvième siècle*"[15].

A good example to explain the ambiguity inherent to density as a form of measurement - and mostly as a cultural challenge - is the way the haussmannian Paris, despite being denser than most of the grands ensembles, remains unanimously appreciated. Bruno Marchand opens some clues on a certain sort of positiveness that relates to the articulation of density and urban life: «*A Paris, la densité du tissu haussmannien est quatre fois supérieure à celle de la plupart des grands ensembles de banlieue. Et cette densité là ne pose pas de problème. Elle est même appréciée pour ses façades régulières qui bordent les grands boulevards ou ses enchaînements de ruelles et de places du noyau médiéval de Barcelone. La densité rime alors avec vie et qualité des espaces publics.*»[].

But even nowadays, as one thinks of high density linked to housing, one may tend to establish a direct association with models of living within extremely small and insalubrious spaces, like the tiny apartments of Hong Kong, Taipei or Seoul[16]. "*Very*

12 *"Often when people talk about density, certain values are implied. The term "high" density may bring up images of efficient land use, diverse communities, and lively street life to some, or dirty streets, crime and poverty to others. The term "low" density may bring up images of home ownership, pastoral landscapes, and families to some, and sprawl, isolation and bland homogeneity to others. These values arise from perceptions about real places and become attached to certain agendas. None of these values is inherently related to actual density measurements, but it can be difficult to break free from existing perceptions. It is possible to have home ownership and families in "high" density areas, and efficient land use and diverse communities in "low" density developments. When planning, it is important to separate values and qualitative ideas about density from quantitative measurements of density."* Read more in: http://densityatlas.org/understanding/

13 *« (...) une grande partie de la population perçoit la densité de façon négative, l'associant à une spéculation effrénée, si ce n'est à la misère, à la promiscuité et au manque de soleil, bref, aux gravures de Gustave Doré sur Londres enfumée et surpeuplée, victime de l'exode rural et de la révolution industrielle"* in Bruno Marchand, Nicolas Bassand, « La Densité, une chance à saisir », *L'hebdo*, March 2006, p. 65.

14 Frederic Frank, Thèse EPFL: "*L'évocation de la ville dense fait souvent référence, en premier lieu, à la ville historique ou la ville du XIX siècle. La forme urbaine de l'îlot est ainsi souvent associée à l'idée de densité urbaine. Pourtant, que l'on considère la densité de contenu ou la densité de contenant, la ville historique ou la ville du XIX siècle, n'est pas nécessairement la plus dense*." (p.109).

15 Nicolas Bassand, "Densité et logement collectif", *Tracés*, nº 135, 2009, p. 23.

16 About the subject of vertical living and compaction, and on the conception of an alternative model for high density areas, see MVRDV, *The Vertical Village*, Rotterdam : NAI Publishers, 2012: "*The*

often, you hear about density and city and you associate with images from Hong Kong or Benidorm, the hyperdense city, with skyscrapers put together and small apartments inside."[17] Still and again, density tends to be perceived negatively.

Moreover, another factor makes the subject even more complex: density being directly linked to context and culture. A Hong Kong local, familiarized with a context of hyper-density, would probably find it difficult to understand European cities to be described as 'dense urban environments'. This challenge has already been raised in the past by Amos Rapoport - mainly in the article "Towards a redefinition of density", 1975[18] - as he claimed that the cultural diversity and the specificity of the context must be taken into account for any approach to density, be it built or human. More recently, Bruno Marchand has reinforced the importance of this parameter: "*(…) il est certain que la densité n'est pas sentie de manière identique par un habitant de New York, de Hong Kong ou de Lausanne, confrontés à des environnements bâtis et sociaux parfois opposés.*"[19].

Rapoport does indeed a fundamental job at decomposing and understanding the multiple simultaneous parameters having direct influence in the concept of density: "*The first point to be made is that while density begins with the number of people per unit area, it must go beyond it. At the same time, the definition of these units and the nature of their boundaries are variable and can play important roles.*"[20]

Amongst the focal themes to be retained from this approach to density, Amos Rapoport highlights[21]:

a) the great complexity of the concept of density
b) the central role of perception in transmitting sensory data to people (their sensorial evaluation of density)
c) the existence of cultural differences – the differential judgement of the 'affective density'

pressure on the East Asian cities has led to an increasing urbanization and densification during the last decades. It has made way for the construction of giant buildings, mostly towers, blocks and slabs. A 'Block Attack' that gradually replaces and scrapes away the more traditional low rise, small scale, often 'lighter' types of architecture and urbanism: the individual houses in Taipei, the hutongs in Beijing, the small wooden houses in Tokyo, the villages in Singapore and other East Asian cities. These urban villages form mostly intense and socially highly connected communities, with enormous individual identities and differentiations.(…) The design based research by The Why Factory and MVRDV offers an alternative, a contemporary Vertical Village – a three-dimensional community that brings personal freedom, diversity, flexibility and neighbourhood life back into East Asian cities." See also the results of the Project, published on the web: http://www.vertical-village.com.

17 Aurora Fernandez Per, Javier Mozas, Alex Ollero, Aitor Deza, *Why density?*, a+t, Vitoria-Gasteiz, Spain, 2015, p. 10.

18 See Amos Rapoport,« Towarda Redefinition of Density», *Environment and* B*ehaviour*, June 1975, pp. 133-157.

19 Bruno Marchand, « La densité ; un défi culturel », *Cahiers de l'aspan-so*, n°1, 2012.

20 Amos Rapoport, « Towarda Redefinition of Density», *op. cit.,* p. 135.

21 *Ibidem,* p. 152.

d) the presence and use of a large number of physical and social mechanisms which modify density in terms of people per unit area

Yet, more than providing clues to decipher density, Rapoport claimed to be opening paths for a wider redefinition of the term, which must still start from a quantitative approach - "*Density has not been adequately investigated, it is clearly more than the number of people per unit of physical space, although this must be a starting point*"[22] - to evolve towards more expressive sensorial approaches and, ultimately, result on a more positive connotation of the concept:

Indeed, for over thirty years, architects, psychologists, geographers and urban planners have been inspired more or less directly by Rapoport to continue the redefinition of density in their respective disciplines, most of them rediscovering the eminently positive potential of high densities[23].

In architecture, Rapoport's seminal works have been re-approached by Vincent Fouchier [24] throughout the 1990's[25], but it was only later that the above mentioned sensorial approach has been applied to Housing programs, to some extent through the research of Martin Steinmann[26].

In an article entitled "Densité des experiences sensibles", Martin Steinmann refers to an idea of density that goes beyond a simple surface ratio to reach a level of density through senses - density through perception - "*Or, celle-ci ne relève pas seulement de l'ordre du construit. Elle est aussi une densité des expériences sensibles. Se trouvent ici associées les qualités de la ville et celles de la campagne, les équipements collectifs et les espaces naturels.*" [27]

22 *Ibid.*

23 See Nicolas Bassand, "Densité et logement collectif", *op.cit.*, p. 24.

24 *« Les recherches des années 1970 se diffuseront progressivement au travers d'autres travaux académiques, notamment ceux du géographe Vincent Fouchier. La notion de densité perçue se répand progressivement. Elle souligne l'importance de concevoir l'indice d'utilisation du sol en fonction d'autres facteurs influençant la perception. D'une notion objective, la notion de densité s'enrichit de variables subjectives qui présentent de grandes qualités mais aussi de grandes difficultés dans leur communication et dans leur transmission.»* Bruno Marchand, Frédéric Frank, "Densité, vers la complexité d'une notion", *Heimatschutz/Patrimoine*, n°1, 2012, p. 20.

25 Vincent *F*ouchier, *Les densités de la ville nouvelle d'Evry* , Anthropos, Paris, 2000 ; Vincent *F*ouchier, *Les densités urbaines et le développement durable, le cas de l'Ile-de-France et des villes nouvelles* , SVGN, Paris, 1998 ; Vincent *F*ouchier, Pierre Merlin, *High Urban Densities, a Solution for our Cities?* , Consulat gén. de *F*rance à Hong Kong, Hong Kong, 1994.

26 Martin Steinmann, «De la perception de l'espace», *Matières*, n°9, Lausanne, 2008; Martin Steinmann, «Espaces et expériences», *Matières*, n°7, 2004 ; Martin Steinmann, «Densité des expériences sensibles», *werk, bauen+wohnen*, n°10, 2002 ; Martin Steinmann, Inès Lamunière I., « Densité » *Faces*, n°40, 1996.

27 Martin Steinmann, "Densité des expériences sensibles", *op. cit.*, p. 64.

Indeed, today's architectural conception is very much influenced by this idea of densification of a given site, and yet still conceiving spaces that seek to replicate the qualities of the non-dense living environments: "*Il s'agit de faire revenir les habitants dans les centres urbains et leurs abords directs en leur proposant une alternative à la maison individuelle*"[28]. Within this context, today's architectural approach to density in housing projects is guided - aside with the usual quantitative measurements - by a densification conceived and mediated through sensorial forms of density – it may be dense but it does not have to feel dense. The idea is that living within density could be as attractive, or even more attractive, than life in the suburbs and accommodate more people within urban centres: "*If housing density was defined by rooms rather than dwellings per hectare, it could have huge implications for development. Rather than cramming couples into tiny boxes, we would create city places that would bring families back from the suburbs.*"[29]

And here we seem indeed to find the guiding principle at the base of today's architectural conception of collective housing: to built dense, yes, but to play with architectural innovation in order to recreate suburban/non-dense values within the new and quantitatively dense housing buildings.

2.1.5. Density and the current architectural conception

Particularly during the two latest decades, the concept of density seems to have attained an intensified value amidst architects and specialized researchers in the field[30]. This idea relates to two complex and contradictory observations: on the one hand, there's the need for compaction - in terms of built envelope (building more within less surface, mostly due to land scarcity and the need economical proficiency); on the other hand, there's the aim for spatial and perceptual quality within compaction and, ultimately, for humanity. "*Each house should still be seen by the user as his or her corner of the world, where the other is neither a threat to daily rest nor the spectator of household activities. Privacy is not lessened by common spaces but by inadequate common spaces, lethal for the dignity of people and buildings*"[31]. We will try to develop the two ideas below.

28 Nicolas Bassand, « Densité et logement collectif », *op.cit.*, p. 23.

29 Jan-Carlos Kucharek, "Happiness per hectare: housing density", *RIBA jornal* , nº 113, 2006, p. 65.

30 About this subject, it might be useful to have a look at some of the following articles: Martin Steinmann, «Densité des expériences sensibles. La nouvelle signification d'un ancien type d'habitation», *Werk, Bauen + Wohnen* n° 10, 2002, pp.10-19; Pascal Amphoux, « Polarité, mixité, intensité Trois dimensions conjointes de la densité», in *Inside Density: NETHCA International Colloquium on Architecture and Cities Series 1*, La Lettre Volee, Bruxelles, 2003, pp. 19-32 ; Vincent Fouchier, *Les densités urbaines et le developpement durable. Le cas de l'Ile-de-France et des villes nouvelles*, Secretariat general du groupe central des villes nouvelles, Paris, 1997; Bruno Marchand, Nicolas Bassand, «Interni, esterni; Interieurs, exterieurs », *rivista tecnica* n°19/20, 2005, pp. 6-13.

31 Aurora Fernandez Per, "Density and desire", in Aurora Fernandez Per, Javier Mosas, Javier Arpa, *Density is home*, a+t research group, Vitoria-Gasteiz, 2011, p. 12.

2.1.6. Density and Compaction: building "the city within the city"

Especially since the requirements of Sustainable Planning have highlighted the disastrous aspects of the urban sprawl, the reflections on the subject of urban concentration - originally raised as a reaction against the principles of the modern urbanism – focused on re-introducing the ideas of vertical densification and functional mix against the strict zoning, but mainly reinstalling the high density levels that the Modernity had denied in the past. Contrasting with the dogmatic forms of the latest decades – the towers, the slab buildings, etc. – a multiplicity of new approaches has emerged, based in the principle of architectural hybridization[32].

This form of architectural practice – towards density – has indeed been activated by three major changes observed, at a global scale, in the first decade of the new millennium:

a) the precepts of sustainable development claiming for a control over the urban sprawl
b) a renewed interest in urban values and in the mix of functions, resulting on the idea of building 'city within the city'
c) the proclaimed need for a redefinition of the term density and its subsequent use in the architectural/urban domain[33].

Some authors have indeed been far-sighted and described the phenomenon, already in the 1990s : "*Aujourd'hui, il s'agit de construire dans cette ville qui est construite en densifiant.*" [34], observe Martin Steinmann and Inès Lamunière. "*Les lieux privilégiés de ce nouvel urbanisme sont les aires industrielles du XIX siècle, désaffectées, situées près des centres. Ces aires sont regardées avec convoitise par toute sorte d'investisseurs. S'il n'est peut-être pas possible de construire seulement des appartements, pour des raisons économiques, il n'est pas possible non plus de construire seulement des bureaux. Il s'ensuit un mélange d'affectations aussi bien que des espaces correspondant à des affectations et il s'ensuit une nouvelle spatialité caractérisée par la densité des expériences que nous pouvons faire.*"[35] These observations are indeed quite sharp at identifying what was about to happen to a large number of old industrial sites in the beginning of the new millennium.

And the truth is that, from then on, and following the completion of some key-projects like the Euralille in the early 1990s by OMA, a lot of other similar 'opportunity-seeds' have flourished as large-scale and mixed projects. "*Aujourd'hui, en Europe,*

32 To mention but an example, in the mid 1990s, Kazuyo Sejima has invoked the topic of diverse density conceiving a series of urban forms that could be designed for a unique density level, motivating architects towards the creativity and innovation for the management of higher density levels (in *el croquis*, 1996).

33 About these three conditions, read Nicolas Bassand, "Densité et logement collectif", *op. cit.*, p.23.

34 Martin Steinmann, Inès Lamunière, « Densité », *op. cit.,* p. 4.

35 *Ibidem.,* p. 4.

la structure des villes se modifie surtout par la réutilisation et le remembrement de terrains libérés par des activités disparues. Ces opérations nécessitent la conception d'une nouvelle structure urbaine sous forme de plan directeur. Pour concevoir ces plans, les hommes de l'art sont contraints de construire une cohérence entre des éléments et des faits d'ordre divers, recouvrant tout ou partie de la complexité du monde réel. Ils ont au cours des temps élaboré des notions éparses et des outils pour prendre la mesure des choses, et tel un « raccommodeur d'échelles », ajuster cet ensemble hétéroclite dans une forme matérielle concrète (la ville, l'édifice)."[36]

The preferred solution is therefore to build "the city within the city" using the wastelands of any kind (industrial, railway or military) and concentrating habitat in areas of easy access (where the train crosses the bus, the car and bike). However density, besides being a real need, is also an opportunity to rethink the habitat and the city, to experiment with innovative and compact architectural forms – which implies giving more emphasis to the qualitative dimension of density than to its usual quantitative dimension (the ratio between the ground surface and the total built space).

Amidst the multiple solutions flourishing within these 'opportunity plots', we will find a large number of interesting forms of Big Buildings. Considered as an exceptional building in most cases, the Big Building is not expected to respect any established norms considering occupancy, volume, heights or setbacks. On contrary, the Big Building is expected to be a form of hyper-densification, in an urban point of view, (a cluster, a point of condensation), which does not necessarily mean that the spaces produced in its interior may be extremely small or compact.

When compared to regular collective housing buildings, the Big Building epitomizes a double and intensified condition of density. Primarily, while paradigm of a solution for the economy of resources, especially when it includes residential uses, the Big Building represents a model of concentration of multiple simultaneous functions. It bears, thus, the conception of a "city structure" within an already built condition. Secondly, it embodies the inner planning of different programs, each implying specific density levels, different requirements and complex articulation spaces in between.

However, the Big Building can also become a paradoxical model when it comes to density. Although, in most cases, this model corresponds to a level of hyper-densification of a given plot, in some cases, the models of housing or other programs conceived therein do not correspond to concepts of high-density living at all. Often, they're even quite the opposite: housing apartments of exceptionally generous dimensions and sold at very high prices. Indeed, within the Big Building, urban density and housing density do not necessarily coincide.

More important is that the Big Building, as a study object, can contain most of the values we're aiming to analyse through our research: the compact city (densification

36 Xavier Malverti, « La grande échelle de Rem Koolhaas, de New-York à Lille : La ville délire », *les Annales de la Recherche Urbaine*, n°82, 1999, p. 15.

within city borders), the association of multiple different uses within a container, and density as a generator of quality and innovation within the dwelling typologies. But above all, we will try to evaluate the validity of the Big Building as an innovative model of density and optimization of resources that can potentially be replicated in other cities and environments.

2.1.7. Density, the Big Building and the problem of its space-time definition

Adding to the complex challenge that is the one of defining 'density', one should note that the concept may suffer strong variations depending on scale, for different spatial scales can considerably change the density coefficient. In order to compare for instance the coefficient of land occupation of different lands in different parts of the city, the determination of the scale and limits must be consistent. Nicolas Bassand explains this idea: "*Pour comparer par exemple le coefficient d'occupation du sol (l'emprise au sol) de différentes portions de ville, la détermination d'une échelle métrique et des limites de secteur, en hectares ou mètres carrés, doit être identique et accompagnée de règles précisant s'il faut extraire ou non les réseaux de circulation, les voiries, les cours, etc. du calcul de densité. Le raisonnement est identique dans les calculs de coefficient d'utilisation du sol (surfaces brutes de plancher cumulées divisées par la surface de la parcelle) qui cherchent à comparer des surfaces habitables pour différents ensembles de logements: il faut que la parcelle et l'échelle métrique soient similaires, tout comme les règle d'extraction des "vides" urbains. On note néanmoins que ces règles élémentaires ne sont pas systématiquement appliquées dans les pratiques urbanistiques et architecturales, faisant perdre la valeur comparative des coefficients calculés*"[37]. This idea may be important to be retained within our treatment of the Big Building, because its scale is somewhat an urban scale; the scale of a city zone.

2.1.8. Density & the design of Collective Housing Buildings

High density housing has become a recurrent theme amid the contemporary housing production in a broad sense: there are such strong and significant constraints linked to the density phenomenon that they push the issue of habitat as close as possible to its limits. Often depreciated for this reason, dealing with 'density' is becoming a true necessity for many contemporary metropolises. It is therefore important to develop a theoretical framework to sustain an understanding on how the different morphologies and housing typologies can respond convincingly to this need.

37 Nicolas Bassand, Thèse de Doctorat, EP*F*L, *op. cit.*

Today's architectural discourse on density focuses indeed on the sensorial aspects of density - referring to the sensations it stimulates, its effect of mass and transparency, the intensity of light and shade, the physical contact with materials and textures [38].

The number of publications appeared in the last two decades on the topic of density denounce, on the one hand, the vagueness and ambiguity implicit on the subject of density (many circular trials to define it) and, on the other hand, a certain fascination that the topic epitomizes to architects and urban planners (density as an intellectual challenge).

We have found indeed numerous articles and books focusing on the subject, such as the Density series, started in the late 1990s[39] and published by a+t since 2002. Such books provide an important catalogue of dense Collective Housing buildings, mainly in terms of housing typologies, in dispersed points of the globe.

More recently, a new series of publications has been launched by the a+t research group on the subject of density – *Hoco – Density Housing construction and costs* (2009) followed by *Next – Collective Housing in Progress* (2010), *Density is Home* (2011), *10 Stories of Collective Housing* (2013) and, more recently, *Why Density?* (2015) or *Form & Data* (2016). Each of these works proposes to set an overview and a redefinition of the topic of density in architecture, evolving from the former publications and seeking, at each time, a more accurate and more significant definition of density in architecture, along with more efficient ways to illustrate it: "*After several years analysing projects, we are beginning to define what density means to us and we think that it is based on the integration between three elements: Agents, fluxes and Territory*"[40].

We have indeed identified, in the ensemble of publications mentioned above, a somewhat good base to approach density as we are aiming to define it and explore it within our research, as it is fundamentally about establishing links between some particular values, mainly the ones that promote:
- the compact city and the sustainable urban development
- good quality collective housing instead of compact individual homes
- the integration and articulation of different functions opposed to the segregation of uses.

38 See Bruno Marchand, Nicolas Bassand, « La Densité, une chance à saisir », *L'hebdo*, March 2006, p. 65.

39 « *We began to be interested in density at the end of the 90s. In architecture publications, housing projects used to be shown as objects, isolated from their surroundings, without any data related to the inputs they contribute to the city* », in Aurora Fernandez Per, Javier Mozas, Alex Ollero, Aitor Deza, *Why density?,* a+t, Vitoria-Gasteiz, Spain, 2015, p. 14.

40 Aurora Fernandez Per, Javier Mozas, Alex Ollero, Aitor Deza, *Why density?*, *op. cit*., p. 14.

Asides with understanding the definition, the historical evolution and the contemporary application of the term density, we will raise the hypothesis that having to deal with high density can become an exciting challenge for architects: it may even, in some cases, lead to architectural innovation and spatial quality. Our ambition in this chapter is nonetheless to identify the potentials of conceiving innovative and high quality living schemes within density, which, as noted by Bruno Marchand, is becoming a key direction in the architectural conception: "*l'actuel regain d'intérêt des urbanistes et des architectes pour cette problématique réside aussi dans le fait qu'ils y voient une opportunité de repenser la ville et l'habitat et d'expérimenter des formes denses, compactes et innovantes*"[41]

41 Bruno Marchand, "Réinterpréter la densité, innovation et paradoxes", *Tracés : bulletin technique de la Suisse romande*, 137, 2011, p. 12.

2.2. Diversity and Mix

Although the terms Diversity and Mix are often paired - and recurrently used as synonyms - their meanings are not exactly equivalent. The term Diversity is defined as "*a range of many people or things that are very different from each other*"[1] – overall, the acknowledgement of clear differences between elements of a given set (for instance, the heterogeneity of elements within a city). Mix, on the other hand, goes beyond the acknowledgement of differences and implies a form of interrelation between parts, which can lead to an entropic result - "*putting different elements together to form one substance or mass*" – or to an articulated/ combined result - "*juxtapose or put together to form a whole whose constituent parts are still distinct*"[2]. In architecture, the concept of Mix does not imply the annulation of differences; instead, it focuses on the articulation of differences, allowing for heterogeneous elements to coexist harmoniously within a single envelope. In social sciences, Mix refers to the way individuals - that can be diverse in culture, life course, social class or lifestyle – relate to one another within a given space.

The urban fabric is the fundamental stage where Mix and Diversity can be acknowledged, in its basic and most intensified form: "*la mixité n'est que la mesure d'un mélange (…) c'est aussi une valeur quantitative, le rapport de proportion entre des groupes d'individus, entre des objets, entre des activités, entre des usages*"[3]. The city has always gathered many different uses and inhabitants within its dense and tight network, and the inherent proximity of different users and uses is said to function as a catalyst for complex forms of coexistence and interaction between individuals and activities. The term 'city' itself intrinsically suggests "*a place where individuals meet and exchange*" [4]: a confluence of amenities, work and leisure that force people to live in community and to enjoy this condition while accepting differences. Mix and diversity – with an intrinsic association to the condition of urban density - are therefore the terms that define a desirable form of urbanity [5].

But whereas Diversity is a natural phenomenon that can be acknowledged within an urban settlement, our understanding of the term Mix points rather at a built phenomenon or a design strategy: the act of transferring to the architectural conception features that, at its base, belong to the life in the city. Mix is about

1 Definition in *Oxford Advanced Learner's Dictionary*, 2005

2 Definition in *The Oxford Pocket Dictionary of Current English 2009*, (originally published by Oxford University Press), 2009

3 Monique Ruzicka-Rossier, « La diversité oubliée » , in *Les Cahiers de L'Aspan* n.13, 2013, p.4.

4 Definition in Oxford Advanced Learner's Dictionary, 2005: « origin: from Old *F*rench cite, from Latin civitas, from civis 'citizen'. Originally denoting a town, and often used as a Latin equivalent to Old English burh 'borough', the term was later applied to foreign and ancient cities and to the more important English boroughs ».

5 "L'urbanité procède du couplage de la densité et de la diversité des objets de société dans l'espace" in Jacques Lévy, Michel Lussault, Dictionnaire de la géographie et de l'espace des sociétés, Belin, Paris, 2013, p. 996.

triggering the relation between elements that a priori do not share the same origin, mimicking what naturally occurs in an urban context.

Different forms of Mix & Diversity

We will observe indeed that Mix, as a strategy, increasingly becomes a trend and direction within the architectural production of our days[6] - and that this condition can relate either to the mix of functions or to social forms of mix[7] (ultimately translated into typological mix). For this reason, and also for the sake of clarity of the general analysis, we have decided to divide this chapter in two parts: Part I - Functional Mix (allowing us to understand the strategies of articulation between different programs and housing) and Part II: Architectural Design and Social Mix (a particular focus on the strategy of mix in dwelling typologies).

In the first part, we will focus on the topic of program mix and functional hybridity, narrowing our study to large mixed-use buildings containing a significant percentage of housing. Before focusing on the study of the selected corpus of buildings, we will start by understanding the base meaning of the concepts Diversity and Mix in urban planning, and then evolve towards the study of mixed-use/hybrid buildings, from its primordial model - house above the shop - to the most complex of its forms (and also our focal study object) - the Big Building. Within the subject of program mix, we're willing to verify the issues implied on the articulation of building and city (building and public space), on the correlation of different functions - mainly housing with adjoining programs - and on the overall qualities and potentials of these buildings as complex articulated systems. We will therefore be analyzing a series of different built models of functional mix - from the most basic to the most complex ones -, structuring our analysis according to the following points:

a) program mix: the range of different programs and the distribution of functions within the architectural volume;
b) the relation between building and urban fabric / building and public space;
c) the distribution diagram – horizontal, vertical and alternative circulation axes;
d) the relation between housing and the adjoining programs;
e) the exploration (or non-exploration) of typological mix/social mix in the housing areas;
f) the way parking is planned within the building.

6 See Bruno Marchand, Christophe Joud, *Mix: Mixité Typologique du logement collectif – de Le Corbusier à nos jours,* PPUR, Lausanne, 2014, p. 5: "*(…) force est de reconnaître que la mixité, qu'elle soit programmatique, sociale, intergénérationnelle ou typologique, est dans l'air du temps.*"

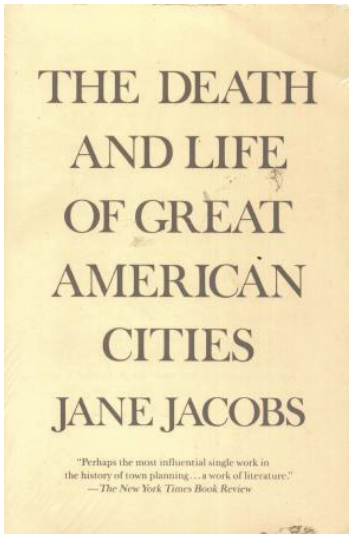
7 See "Mix(cite) Une formule À reinventer", in *AMC MIX(CITE) Villes en Partage*, 2012, p.6 : "*La recherche de mixité sociale est considérée comme un des points fondamentaux des politiques urbaines et s'est traduite en France depuis des années par un effort continu sur le terrain de l'habitat. Mixité des fonctions et mixité générationnelle sont aussi devenues des aspirations collectives dans une société qui reste confrontée à la spécialisation des territoires et à l'individualisme des comportements humains."*

In a second part, we will focus on the topic of architectural design and social mix – a leitmotiv in the current conception of collective housing buildings. The subject is triggered by the acknowledgement of the intrinsic heterogeneity and changeability of our society, which *forces the conception of a wide range of typologies in order to respond to the varying needs of different individuals and family types*[8]. Thus, it is our priority to focus on the articulation of different dwelling typologies, offering the largest possible variety in terms of configuration, size and distribution to suit different types of inhabitants and domestic groups, from multigenerational families to mono-parental families, singles, elder people or large recomposed families. Simultaneously, it is a key aspiration of today's planning to be able to effectively soften social differences and to rebuild social links between inhabitants[9], avoiding the social problems generated by segregation that were experienced in the past. In that sense, we have selected some exemplary case-studies that will allow us to analyze:

a) the variety of dwelling typologies planned within a collective housing building;
b) the quality of the articulation spaces between dwellings and their contribution to a balanced community life;
c) the conditions of living together – the subtleness of the articulation between publicity and privacy.

8 Quantifiable entities such as the *generic citizen* and the *common family* (the couple with two children), that have once been base units for the work developed by the modern architects, are no longer valid references in our days.

9 See Bruno Marchand, Christophe Joud, *Mix: Mixité Typologique du logement collectif op. cit.,* p 5: « *(…) reconstituer des liens sociaux entre les habitants* ».



Jane Jacobs, *The Death and Life of Great American Cities*, Modern Library, NY, 1961.

2.2.1. Models of Density and Functional Mix Urban Planning

"This ubiquitous principle is the need of cities for a most intricate and close-grained diversity of uses that give each other constant mutual support, both economically and socially. The components of this diversity can differ enormously, but they must supplement each other in certain concrete ways." - Jane Jacobs, *The Death and Life of Great American Cities,* Modern Library, NY, 1961

The associated terms *density*, *diversity* and *mix* have repeatedly been enhanced as key strategies for a successful urban planning. The benefits of diversity and concentration have indeed been central in several urban theories and defended by important authors like Jane Jacobs (1916-2006), in *The Death and Life of Great American Cities* (1961)[1], and Lewis Mumford (1985-1990)[2] in the early 1960s. Yet, its prominence seems to have prevailed until our days, as the theme is also central in more recent works like the ones of Christopher Alexander in *Nature of Order* (2004) or Jacques Lucan in *Où va la ville aujourd'hui – formes urbaines et mixité* (2012), having influenced the work of some of the most prominent architecture offices of our days[3].

The conviction that a balanced mix of uses within a city represents an effective solution to ensure a healthy and wealthy urban life has influenced most of the urban operations realized in the latest decades, relating primarily to the mix of functions and, ultimately, to social forms of diversity and mix.

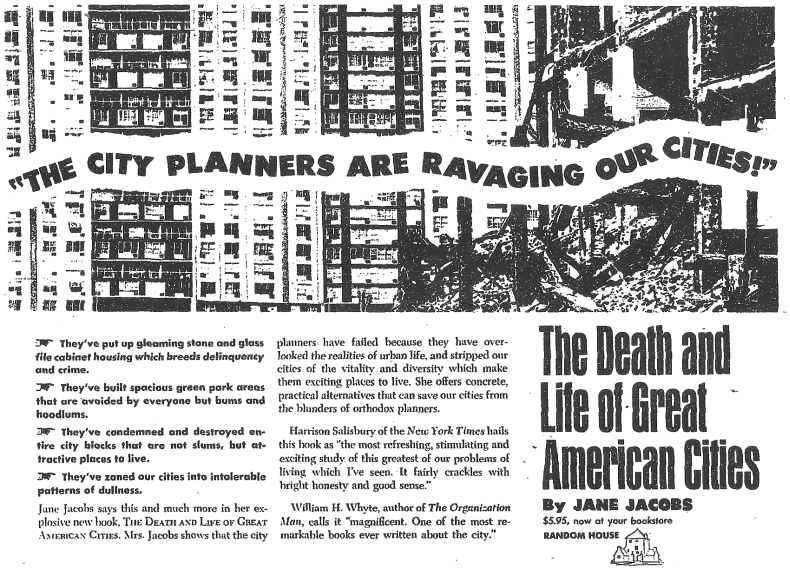
In contemporary urban design theories, *density, diversity* and *mix* have been understood in terms of social vitality of the neighbourhood – active streets day and night, uses that can support each other, reducing car use and congestion, increasing urban quality and pedestrian life.

In *The Death and Life of Great American Cities*, Jane Jacobs has centred her preoccupations not only on the strategy of *mixing*, but mainly on the idea of *diversity*. Jacobs's work gives a complete account of the deterioration process that the American cities have suffered as a consequence of the massive construction of offices after World War II, resulting on saturated urban centres – a marketplace version of the Athens Charter that promptly revealed the undesirable consequences of functional zoning. As stated by Iñaqui Ábalos (1956) and Juan Herreros (1958), "*Jacobs served as an early champion of the positive effects of urban diversity and*

1 Jane Jacobs, *The Death and Life of Great American Cities,* Modern Library, NY, 1961.

2 Lewis Mumford, Le déclin des villes : ou la recherche d'un nouvel urbanisme, France-Empire, Paris, 1970; Lewis Mumford, The urban prospect, London : Secker & Warburg; Lewis Mumford, The culture of cities, New York : Harcourt, Brace, Jovanovich, 1970.

3 Understanding the meaning of mix and diversity in urban planning is indeed fundamental to our research. Although we will remain focused on the Big Building, we will try to understand whether the mechanisms within this enormous device can derive into more complex social environments that may eventually be able to reproduce the natural dynamics of an urban environment.



Jane Jacobs, *The Death and Life of Great American Cities*, Modern Library, NY, 1961.

concentration"[4]. Aside with underlining the *need for concentration*, Jacobs focuses on understanding how cities can effectively provide diversity and also how such diversity can sustain itself by establishing its own networks and links of mutual support. This idea is also implicit in Lewis Mumford's praise for *collectiveness,* in *Landscape and Townscape* (1960), as way of stimulating the largest possible number of reunions, encounters between people and varied groups, in a way that *"the drama of the social life can be played, with actors and spectators exchanging their roles"*[5].

Jane Jacobs interprets the phenomenon of *high density* as a *magnification of urban life of the Metropolis*, identifying a direct relation between the notion of *density* and the conception of elements like the street, the square and other urban events. Density – aside with the simple act of bringing different people together into one place - significantly increases the potentials of encounter. Yet, there needs to be some form of diversity and quality on the channels of exchange. In that sense, Jacobs thoroughly distinguishes the idea of *density*, in the sense of concentration within the city - of diverse entities and uses - and the *density* that is generated, for example, in the post war mass housing projects[6]. In order to clarify the differences, while referring to Le Corbusier's Radiant City as an example, Jacobs describes it as *"the most dramatic idea to apply anti-city planning to existing cities, for it consists not only in planning a completely new physical environment but also what she considers to be a social utopia"*[7]. Jacobs claims that Howard's ideas of the Garden City - opposite to urban diversity - have been adapted to a modernist metropolis of high-rises: "*Le Corbusier was able to accommodate much higher densities of people. His vertical Garden City was planned to house 1,200 inhabitants per acre. The skyscrapers of the core area would cover only 5 per cent of the ground, leaving 95 per cent for open space and parks.*"[8]. Le Corbusier's Radiant City was composed of huge skyscrapers in a park-like setting, which reveals close common points between Howard and Le Corbusier. However, the density that is generated within Le Corbusier's high-rise was dramatically different from the density that Jane Jacobs defended: the need for concentration within cities - reproducing and enhancing the virtuous complexity of the urban environment. Jacobs's observation is indeed relevant to our research, for we need to differentiate our research subject from the one of *mass*

4 Iñaki Ábalos, Juan Herreros, *Tower and office : from modernist theory to contemporary practice*, MIT, Cambridge, 2003, p. 230.

5 Lewis Mumford, *"Landscape and Townscape"*, in *The Urban Prospect*, NY, 1960. See also his reference to the complexity of the city events: *"To turn away from the processes of life, growth, reproduction, to prefer the disintegrated, the accidental, the random to organic form and order is to commit collective suicide; and by the same token, to create a counter-movement to the irrationalities and threatened exterminations of our day, we must draw close once more to the healing order of nature, modified by human design."*

6 Referring to the quantity of dwelling units per Ha.

7 Jane Jacobs, *The Death and Life of Great American Cities, op. cit.,* p. 143-221.

8 Mattias Wendt, The Importance of Death and Life of Great American Cities (1961) by Jane Jacobs to the Profession of Urban Planning, New Visions for Public Affairs – Volume 1, Newark, 2009, p.6 (in www.suapp.udel.edu/nvpa/home).

housing; what we're aiming to identify is the ensemble of features that characterize a wealthy urban environment of density, diversity and complexity, and ultimately understanding whether these can be 'transferred' to the design of the *Big Building*.

In *The Death and Life of Great American Cities*, Jane Jacobs has identified the fundamental "conditions for city diversity" that have to do with form, use and economics: *mixed primary uses*, *small blocks*, *aged buildings* and *concentration*, suggesting that "*an effective urban practice is not only a matter of physical design*"[9]. The concept of keeping places active 24/24, in order to maintain urban areas permanently active, while avoiding security issues, has become popular in Jacob's writings. She advocated that mixed primary uses bring *"different kinds of people together and promote day-and-night use of a district"*[10]. Small blocks, she said, meant *"more intersections and therefore more opportunities for crossing paths and social variety on the street. (…) And concentration guarantees that people and uses will rub shoulders enough to promote interaction and interchange"*[11]. Indeed, Jacobs systematically referred to the importance of links and articulations as fundamental backbones for the city diversity. But did she ever contemplate these effects to be triggered and developed architecturally within a confined spatial envelope? Could the spatial wealth of the city ever be effectively recreated via internal three-dimensional circulation paths instead of the traditional street and sidewalk?

As a consequence of these new urban theories and the new logics of the real estate market, theorists and planners started focusing on the urgency to revise the topological schematism of the modernist city and its commercial centre. By the late 1960s, the concept of functional layering reached acceptance from an urban and commercial planning perspective as "*a way to obtain the density characteristic of urban life without the negative effects of what was typically its disorder*" [12]. Life-work schemes offered indeed a striking alternative to mobility within the city. These schemes were especially favoured in the city centre, and they reinvigorated the debate about the radical effects of the Athens Charter's functional zoning.

9 Jane Jacobs, *The Death and Life of Great American Cities, op. cit.,* p. 143-221.

10 *Ibidem.*

11 In *The Death and Life of Great American Cities*, Jane Jacobs has identified the fundamental "conditions for city diversity": mixed primary uses, small blocks, aged buildings and concentration. "*Taken as a group, these four attributes deal with form (small blocks and concentration), use (mixed primary uses) and economics (aged buildings)" – suggesting that "effective urban practice is not only a matter of physical design*". (…) Mixed primary uses bring different kinds of people together and promote day-and-night use of a district. Small blocks mean more intersections and therefore more opportunities for crossing paths and social variety on the street. Aged buildings, with lower rents, allow start-up businesses and families/people of lower income levels to establish themselves in neighborhoods. And concentration guarantees that people and uses will rub shoulders enough to promote interaction and interchange. See Howard Davis, *Living over the store – Architecture and local urban life*, Routledge, NY, 2012, p. 93.

12 Iñaki Ábalos, Juan Herreros, *Tower and office : from modernist theory to contemporary practice*, *op. cit.,* p. 230

Development opportunities for mixed-use buildings began to appear, either through the persuasive channels of local incentive regulations, as in New York, or through the initiative of investors, as in Chicago. "*These mixed types facilitated a revision of the typology and urban significance of the skyscraper*" (…) *As instruments of urban organization, layered typologies increasingly depended on the ground floor and the basement level – on their infrastructural connections and their capacity to transform pre-existing conditions*"[13].

13 *Ibidem.*

Source: author diagram.

2.2.2. The *house above the shop*

Understanding the meaning of the 'mixed-use' concept - and mainly, understanding the base principles behind the mix of housing with other functions – privacy, publicity, work and living - implies looking back at the seminal and most common form of program mix: *housing and commerce*, or the model '*house above the shop*' - a typology that has unceasingly had a strong impact on the qualities of the neighbourhood and daily life.

This mixed-use type - bearing an evolving character, in constant variation according to density, changeable building types, urban morphology and economy – is portrayed by Howard Davis in the book *Living over the store – Architecture and local urban life* (2012)[1]. Being one of the first products of urban densification, the shop/house model is said to be *"an outcome of urban morphological conditions that result in the two functions of dwelling and commerce each being optimized for the same location*".[2]

An important feature of this model, besides merging two functions, is the fact that it is deeply rooted onto the urban fabric, functioning as an intensive activator of daily life in the cities. House, shop and street are three elements in constant interchange of intensities; they are universal to any social or cultural type and, hence, the first generators of a wealthy urban system. This model also stimulates our thoughtfulness on the importance of the ground floor, the place where the public and the private interact, as fundamental elements to characterize a building and its articulation with the urban fabric[3].

Davis describes the Western city of our days as "*a disembodied entity… reduced to fragmented zones, functions and professional institutions*" and attributes this phenomenon partly to the decline of the traditional *shop/house*[4] against the advent of the traditional *department store*[5]. Based on the works of Jane Jacobs and Christopher Alexander, he intends to demonstrate that the shop/house is a

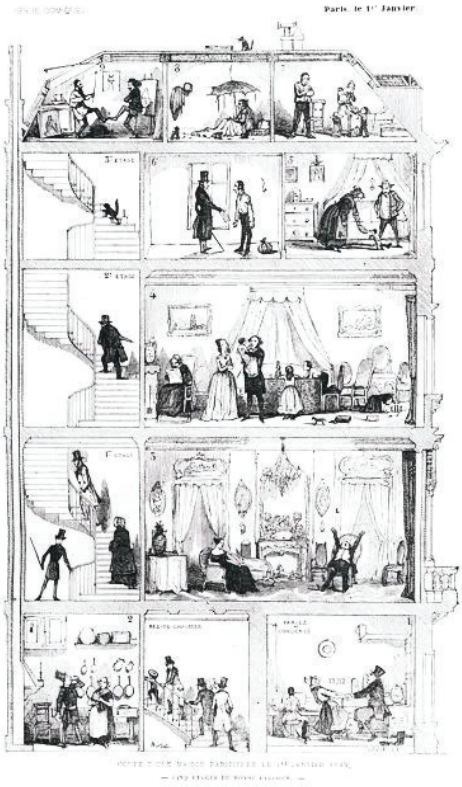
1 Howard Davis, *Living over the store – Architecture and local urban life*, Routledge, NY, 2012.

2 Ibidem., p. 13.

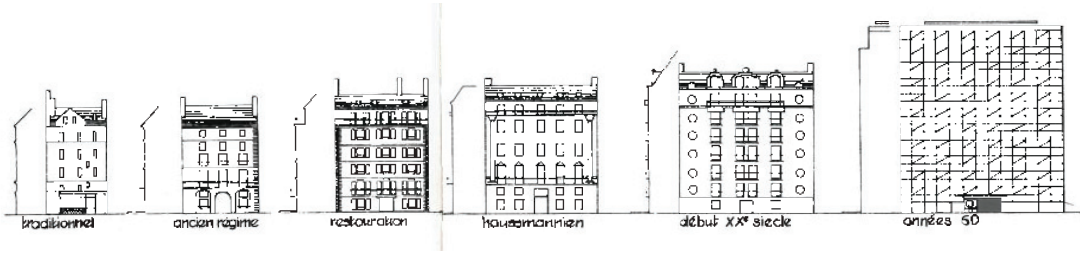
3 See Doris Zoller's article "Ground-floor Zone – Entrances and transitions", in Ulrike Wietzorrek, *Housing +: on thresholds, transitions, and transparency*, Birkhäuser, Basel, 2014, pp. 149: *"Assigning functions to specific areas on the ground floor is an essential topic. They can either be laid out according to their purpose or designed so they are open to various uses. The later makes it possible for seemingly irreconcilable things to coexist and avoids a strict demarcation of individual areas."*

4 Howard Davis, *Living over the store – Architecture and local urban life*, *op. cit.*, p. 7.

5 Read about the appearance of the department store in Nikolaus Pevsner, *A History of Building Types*, Thames and Hudson, Washington, 1976, p. 267: *"The first department store was the Bon Marché, created in 1852 by Aristide Boucicaut."* It might also be important to understand the difference between shop and store, in p. 265: *"Now to return to the real subject of this chapter – the shop and the store – it must be remembered that how – ever grand and thrilling arcades are, they consist of individual, single shops each selling its own special wares. The phase of transition from shop to store is the shop selling a multitude of goods, though goods somewhat more specialized than the real department store".*



Bertall, *Les cinq étages du monde parisien*
Source: l'Illustration, 11 janvier 1845.



Évolution des gabarits de l'immeuble parisien depuis le XVIII siècle: Document APUR.
Source: François Loyer, ***Paris XIXe siècle : l'immeuble et la rue***, 1997

building type of extreme importance to the future of cities. Davis seems indeed to suggest a return and a 'complexification' of this mixed use model, for it might have the ability to *"invigorate higher densities, greater connectivity, and a layered environmental complexity in all its multiplicity and ambiguity"*[6] —a model of neighbourhood fabric that many urban districts currently lack. And indeed, the concept of *everyday hybridity*[7] - both in terms of function mix and of social mix - is indeed a key concept behind most strategies of today's urban and architectural production.

This fundamental mixed typology emerged centuries ago – "*it is possibly as old as commerce and cities themselves*" [8] - and is still a common model in today's urban centres. It inaugurates the fundamental - and possibly strongest - form of program mix including habitat, being a polarizer for urban logics and lifestyle changes. Moreover, it instigates the concept of *living and working* within the same building - a concept that has been popular amongst urban theorists and architects in different historical moments and that may incarnate the very predecessor of the "city within city" concept: *"it is the spatial manifestation in one structure of two common economic conditions of the city: it puts commerce on the street, and it lets people live where they work"*[9]

Numerous historical examples sustain the idea that program mix is a fundamental condition of any urban environment. This constant character of the shop/house model is noted namely by Nikolaus Pevsner (1902 – 1983) in *A History of Building Types* (1976) [10]. While referring simultaneously to London and Parisian models of the early 1800s, Pevsner writes: *"Shops faced on to the street and also to the courtyard. There were flats above the shops. While the Empire Style was popular in France, Greek Revival was popular in England"*[11].

The shop/house model - with commerce at the ground level and housing floors above - may also match the haussmannian model of the XIXth century[12]. The

6 Howard Davis, *Living over the store – Architecture and local urban life*, *op. cit.,* p. 10.

7 "*In the end, we come back to everyday hybridity: the idea that everyday life is not easily classifiable into clear functional zones or standard architectural types. The daily life of a household, street, or neighborhood is characterized by interactions among the functions that make it up that are so powerful that they render a reductionist analysis much too simplistic. In support of this complex daily life, the shop/house is a "model hybrid." It connects people and functions inside it; it is symbiotically connected to the neighborhood outside it; it changes cyclically over time in its use and is malleable in its architectural form*" in Howard Davis, *Living over the store – Architecture and local urban life*, *op. cit.,* p. 231.

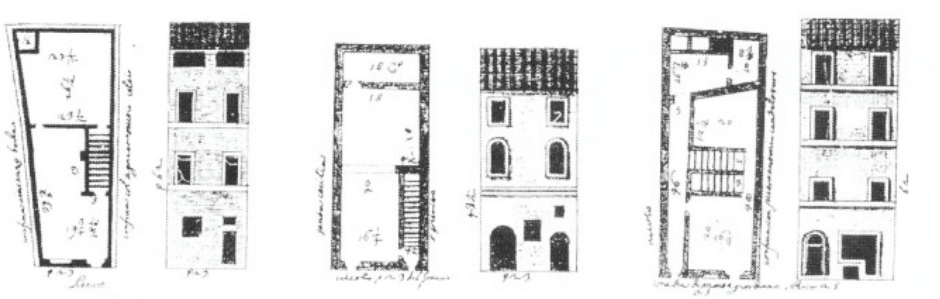
8 *Ibidem*, p. 12.

9 *Ibid.,* p. 1.

10 Nikolaus Pevsner, "Shops, stores and department stores", in *A History of Building Types*, *op. cit.,* pp. 257-272.

11 Nikolaus Pevsner, *A History of Building Types*, *op. cit.,*p. 267.

12 Read more about the Haussmannian schemes in in Françoise Choay, "Pensées sur la ville, arts de la ville", in Georges Duby *Histoire de la France urbaine*, Éditions du Seuil, 1983, pp. 158-237.

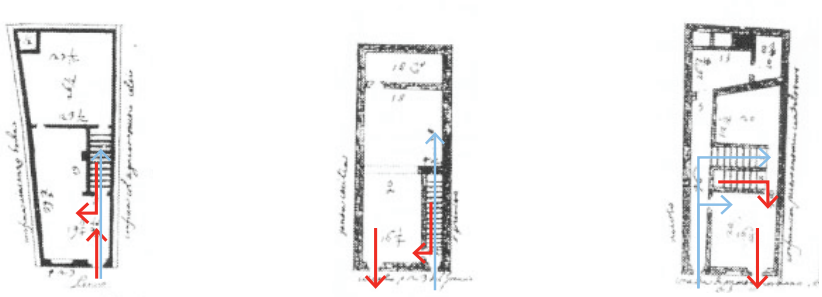


stair inside front room/shop

stair near street

passage bypasses shop

Roman shop/houses in the eighteenth century, with different stair arrangements and shop designs. (From Bascià et al., La Casa Romana)
Source: Howard Davis, *Living Over the Store: Architecture and Local Urban Life*, p. 37.



Analysis: different forms of articulation between shop, house and street.
Source: Howard Davis, *Living Over the Store: Architecture and Local Urban Life*, p. 37.

truth is than more than a simple functional mix, this model reveals an effective and complex form of social mix, as it is proven in Bertall's illustration[13], with commercial activities at the ground level, the first and second floors being the noble floors with higher ceilings, the third floor to the 'petite bourgeoisie', and finally the popular class compacted under the attics. By then, the concept of 'social mix' wasn't so much of a 'strategic design' plan willing to solve social discrepancies, but rather something natural, as described by Monique Eleb-Vidal and Anne Debarre-Blanchard in *Architectures de la vie privée* (1989): "*Le mélange social est encore un phénomène banal. Sur un même palier dans la même maison à loyer, des habitants de conditions sociales et de niveaux de fortune différents continuent à cohabiter*"[14].

But Davis refers to several other ancient examples to withstand this quintessential model of functional mix: from the *insulae* of ancient Rome; the small buildings on American main streets with stores below and apartments above; New York apartment buildings with stores on their ground floors; London terraced houses with ground-floor shops or with shop extensions toward the street; shop-houses in Japan, China and southeast Asia; seventeenth-century canal houses in Amsterdam, etc.

Yet it is in the illustration of three Italian vernacular layouts - Rome, Florence and Venice - published in *Living over the store – Architecture and local urban life* [15] that we have managed to identify interesting nuances at the ground level, in terms of accessibility and circulation. In the first example, for instance, the access to the house is done through the shop, which suggests the apartments above being inhabited by the retailers – living and working are two functions intrinsically interconnected here. In the middle scheme, shop attendant and inhabitant could be different persons, as the inhabitant could reach his house from the street, bypassing the shop. The third example goes even further on this detachment, allowing even for multi-level housing storeys. Indeed, the analysis of these three plans helps us to identify the three fundamental points to be observed in most of the mixed-use/ hybrid buildings:

a) building and street - the importance of the ground-floor

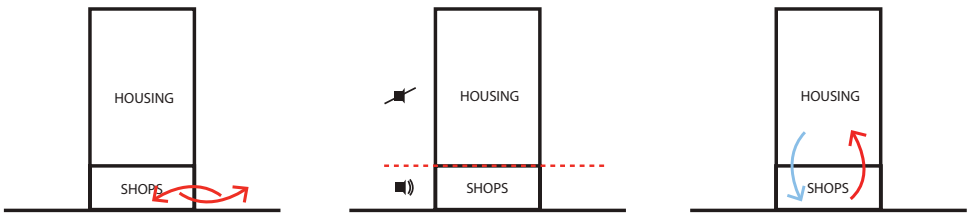
We have observed the *practical and lived value that the shop/house might have to invigorate the urban life*, playing a critical role in "*how the building, the neighbourhood, and the city— and the inhabitants of the city — can be part of one interconnected system*"[16].

13 A picture produced by Bertall, engraved by Lavieille, and published first in *Le Diable à Paris, Paris et les Parisiens,* «revue comique» Jules Hetzel éditeur, 1845. Republished in *L'lllustration,* on the 11th of January 1845 (p. 293) under the title: « les cinq étages du monde parisien ».

14 Monique Eleb-Vidal and Anne Debarre-Blanchard, in *Architectures de la vie privée XVIIe-XIXe siècles*, Archives d'Architecture Moderne, Bruxelles, 1989, p. 102.

15 Howard Davis, *Living over the store – Architecture and local urban life, op. cit.,* p. 37.

16 Density is again described as a fundamental condition to make these activities possible, more than through form or any other architectural condition: *"Collectively, these buildings are not definable as*



a) b) c)

Fundamental issues observed in the house&shop model.
Source: author diagram.

b) housing and public uses – intimacy and privacy

We have understood the importance of keeping different levels of privacy within the building, along with the structuring importance of ensuring the privacy to the dwelling.[17] Indeed, mixing housing and services implies allowing contact between people while keeping enough distance to preserve individuality and privacy. Architectural diversity will not necessarily engender links but it can allow different people to live and work within a same building. In order to allow exchange, it shall be rather the design of intermediary spaces the one to stimulate the mix of programs, people, functions or morphologies to function at its best.

c) synergies between uses within a hybrid building

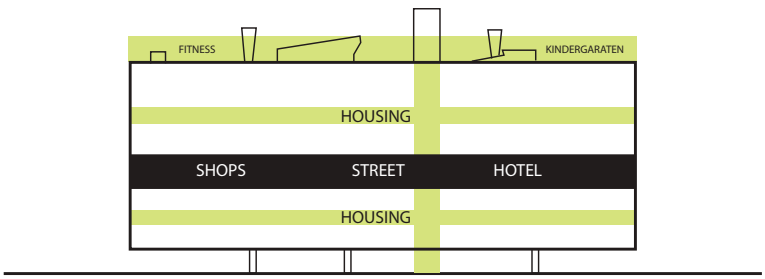
We have observed that "*the relationship between the shop/house and everyday life is supple. On a day-to-day basis, work may be easily done in the house or in easy access to the house; workplace and dwelling are sometimes the same, sometimes together, easily intertwined and overlapped. Moving back and forth between domestic and economic uses may accommodate functions that readily expand and contract.*"[18]

The concept of everyday hybridity and the abolishment of the city's functional zones is a key concept of today's urban and architectural production, and also one that for several decades has determined the urban fabric and the architectural conception of mixed-use buildings.

a single architectural type – a building configuration clearly defined in function or geometry. But they do exhibit common ideas. They are located in places where densities allow for commercial activity.", Howard Davis, *Living over the store – Architecture and local urban life, op. cit.,* p. 87

17 *"They put commercial activity on the ground level, prioritize it over domestic functions, and ensure the privacy of family life relative to the public realm. They support the diversity of urban neighbourhoods. And they exhibit flexibility of use over time."* , *Ibidem*, p. 87

18 *Ibid.,* p. 89.



Source: author diagram.

2.2.3. Le Corbusier's *Unité d'Habitation*

Although *a priori* seen as unrelated models, the *Unité d'Habitation* could be considered an evolution from the *îlot Haussmannien.* This particular viewpoint is endorsed by Philippe Panerai, Jean Castex and Jean-Charles Depaule in *Formes Urbaines, De l'îlot à la barre* (1997): *"Aussi l'Unité d'Habitation nous apparaît-elle à la fois comme la negation de la ville et comme l'ultime avatar de l'îlot"*[1]. The pertinence of this evolution is justified through a sequential reduction of the elements that establish the transition between the building and the urban fabric – the street / the border / the yard / the background – aside with the portrayal of an *îlot* that gradually loses its front and a back façade while becoming home for increasing levels of social diversity and complexity.

Yet, Le Corbusier himself seems to point out, even more significantly, to the work of Haussmann as an important reference to his own work: "*Le baron Haussmann fit dans Paris les plus larges trouées, les saignées les plus effrontées. Il semblait que Paris ne saurait supporter la chirurgie d'Haussmann. Or, Paris, ne vit-elle pas aujourd'hui de ce que fit cet homme téméraire et courageux? Ses moyens? La pelle, la pioche, le charroi, la truelle, la brouette, ces armes puériles de tous les peuples… jusqu'au machinisme neuf. C'est vraiment admirable ce que sut faite Haussmann.*"[2].

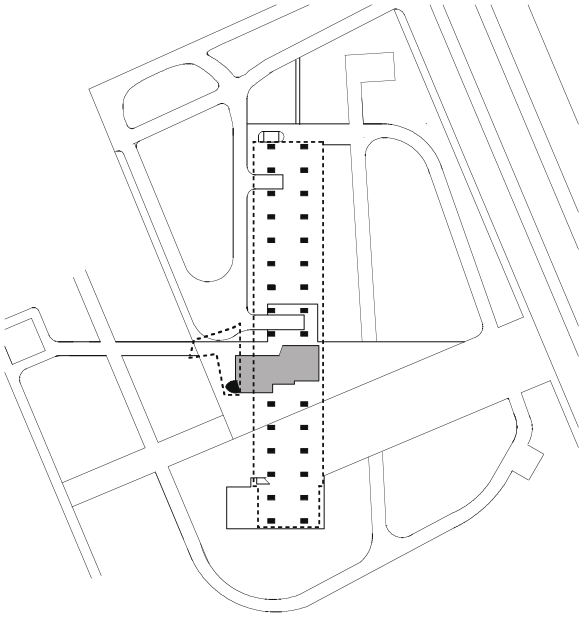
Le Corbusier wishes to innovate, but mostly, he intends to depart from the traditional/classic elements, to question them, just as much as Haussmann revolutionized Paris with the *simple tools of every race*. And so were the urban elements he has chosen for his *Unité d'Habitation* - housing, retail, workplaces, hotel, school, street: overall, the classical city functions and the classical street-home relationship – all within a unitary container, intending to explore the potentials of spatial quality within high density constructions[3]. The dense and massive volume of the *Unité d'Habitation* has 135 meters length by 24 meters width and it is 56 meters high. The vertical circulation is ensured by 4 lifts (one of them possible to be used as service lift for heavy goods, the other a delivery lift for retail), bearing an articulated system of vertical and horizontal circulation axes. Beyond the evidence that the *Unité d'Habitation* bears a sense of independence from the urban ground and appears to be conceived in disregard of any particular urban context[4], Le

1 Philippe Panerai, Jean Castex and Jean-Charles Depaule, *Formes Urbaines – de l'îlot à la barre*, Parenthèses, Marseille, 1997, 2012, p. 138.

2 Le Corbusier, *Urbanisme*, *op. cit.,* p. 149.

3 For Le Corbusier, the transition from the *îlot haussmannien* to the *Unité d'Habitation* was not that radical if we consider, for instance, the precedent project of the *Immeuble Clarté* (with Pierre Jeanneret) built in 1931-32 in Geneva, and still very much in line with the *Haussmannian* model (with retail at ground level, housing above, inner courtyard), but where he has experimented already with variety in apartment sizes, duplex typologies, etc, which were developed with higher complexity within the *Unité d'Habitation*.

4 *"Plus que les divers grands ensembles qu'elle a indirectement produits mais où se glisse un compromis dû à une localisation précise, elle reste l'image abstraite et absolue, la fiction d'un urbanisme autre.", in* Philippe Panerai, Jean Castex and Jean-Charles Depaule, *Formes Urbaines – de l'îlot à la*



Site Plan 1:2500
Source: Hilary French, 2008.

Aerial Photo of the Unité d'Habitation in 1952
Source: Jacques Sbriglio, L'Unité d'Habitation de Marseille (1992)

Corbusier's fundamental commitment was to optimize the ultimate concentration and density of urban life: "*Je propose de rassembler la ville sur elle-même, intra-muros, de porter la densité de la population à mille*."[5] His strategy was indeed to add order and a machine-like efficiency to the articulation of all city functions[6] – circulation, activities, living – enabling the estimated 1500 residents to live upon a new 'ordered lifestyle'[7]. This latent functional diversity allows L.C. to inaugurate the concept of a building that is active 24 hours a day, leaving simultaneous space for functional and social mix and for individual freedom, simultaneously.[8]

As Le Corbusier seemed to relish the exploration of the functional mix within the *Unité d'Habitation* as a form of amendment of his former segregationist urban strategies - « *a la différenciation des fonctions urbaines à l'échèle de la ville succède un mélange nouveau des différentes fonctions vitales que sont habitats, loisirs, achats quotidiens.* » - the functional organization of the building in section has met an unprecedented complexity. Indeed, the conception and design strategies used on the planning of this building have been innovative. The two-dimensional drawing is replaced by a design which is primarily developed in section, and then through the help of sketches, perspectives and models that help controlling and defining the complex three-dimensional reality of the building. "*La pensée de l'espace ou, comme il le dit lui-même, de l'"urbanisme à trois dimensions" (…) c'est à dire d'une géométrie qui donne les trois dimensions de notre espace comme équivalentes: la rationalité ne sera donc pas simplement rationalité du plan mais entendra engendrer une dimension en hauteur*".[9] The traditional exercise of planning urbanism in plan has changed in this model of density, and the different city functions were now stacked and planned in height.

*barre,*op. cit. p. 131

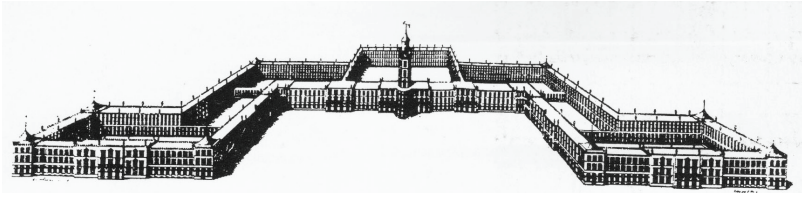
5 Le Corbusier, "La ville radieuse", *l'Architecture d'Aujourd'hui*, Paris, 1935, (Réédition: Vincent, Fréal & Cie, Paris, 1964), p. 107.

6 Le Corbusier, "La ville radieuse", *op. cit.*, p. 57: "*Et, d'un coup, les événements urbains s'organisent: les problèmes de circulation sont résolus; l'institution des "services communs", supprimant le gaspillage, apporte à l'exploitation domestique (à chaque logis) des bienfaits urgents, nécessaires et libérateurs*".

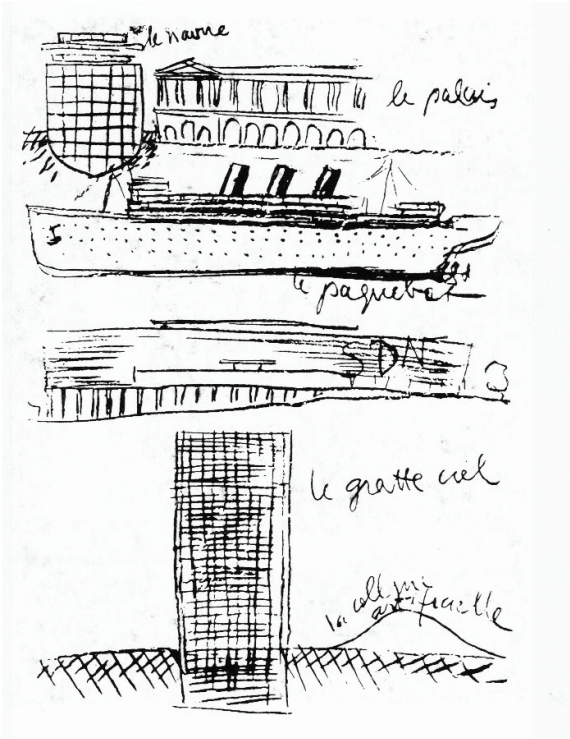
7 See Scott Johnson, *Tall Building: Imagining the Skyscraper*, Balcony Press, Glendale Calif., 2008, p. 20: *"In his work, he borrowed from the new logic of a functionally ordered industrial society, seeded with the scale of a haussmannian Paris, and created an intellectual vision in which he felt buildings, as objects, could meet nature, as vast gardens."*

8 Le Corbusier, "La ville radieuse", *op. cit.*, p. 37: *"Si j'arrive à remplir les vingt-quatre heures de mon homme, si, plus que cela, j'arrive à le combler d'aise, si mieux encore, dans cette organisation collective, j'arrive à lui donner la liberté individuelle (…) et à satisfaire aux initiatives que cette liberté fera naître?"*

9 Jacques Sbriglio, Le Corbusier, *L'Unité d'Habitation de Marseille,* Éditions Parenthèses, Marseille 1990, 2013, p.9.



The phalanstère, as proposed by Victor Considerant in c. 1834 - a reference project for Le Corbusier
Source: David Jenkins



Sketches of the ocean liner, the palace the collective housing building and the skyscraper - the ensemble of the quintessential Corbusean metaphors
Source: sketch published in Précisions, 1929

the potentials of the densification in height

Le Corbusier's declared references with regards to housing - the cruiser, the monastery[10], the *familistère*[11] – confirm his obsession with *density*, with function, with order, as much as they clarify the relationship he intends to establish between the inhabitant and his society – *l'association d'une « imagination spatiale » et d'une « imagination sociale »*[12]. To this extended group of references, Le Corbusier adds his simultaneous hate and fascination towards the American skyscraper [13] as he recognizes the great potentials of the densification in height: *"Le gratte-ciel est un outil. Outil magnifique de concentration de population, de décongestionnement du sol, de classification, d'efficacité intérieure, une source prodigieuse d'amélioration des conditions du travail, un créateur d'économie et, par là, un dispensateur de richesse."*[14]

the wealth of the horizontal connection

Le Corbusier remains, nonetheless, very critical about the effects of the urbanism produced by a multiplication of skyscrapers – mainly the streets becoming too narrow – aside with the limited possibilities of the vertical circulation. Thus he suggests the introduction of coexisting vertical and horizontal axis: *"Les gratte-ciel de New York sont trop petits et ils sont trop nombreux. Ils sont une preuve, celle des nouvelles dimensions et des nouveaux outillages; la preuve aussi que tout peut être entrepris désormais sur un plan général nouveau, un plan symphonique – étendue et hauteur."*[15] Le Corbusier's scheme intends to densify while simultaneously liberating ground space in order to provide light, view and green spaces. Simultaneously, L.C. enhances the potential of internal horizontal circulation and its social potential, explored by means of the interior horizontal streets and large leisure areas at the rooftop.

10 About Le Corbusier's references, see Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.*, p. 175: *"A l'image du paquebot s'associe tout naturellement l'idée du monastère, si chère à Le Corbusier depuis sa jeunesse." (...) "Le Corbusier a crée quelque chose qui appelle la comparaison avec le phalanstère de Charles Fourier."*

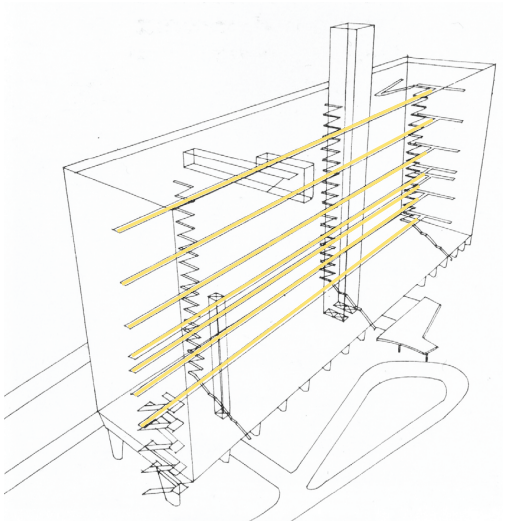
11 See Georges Duby, *Histoire de la France urbaine*, Éditions du Seuil, mai 1983 pp. 167. Read the description of the familistère de Guise (Paris, 1874), where one can clearly recognize a similar base-thinking to the one of Le Corbusier : *« Il ne s'agit plus seulement du logement et de ses annexes, mais, conformément aux principes de Fourier, d'un établissement qui intègre et classe l'ensemble des activités sociales. D'un coté le travail (la fabrique des poêles de Godin), de l'autre un habitant collectif assorti de services communautaires (écoles, bibliothèques, commerces). Cet établissement, destiné à « enlever à l'ouvrier les motifs d'éloignement de sa demeure », illustre sa capacité de rendement et de productivité que dissimule, sous un hédonisme de surface, le modèle de Fourier. »*

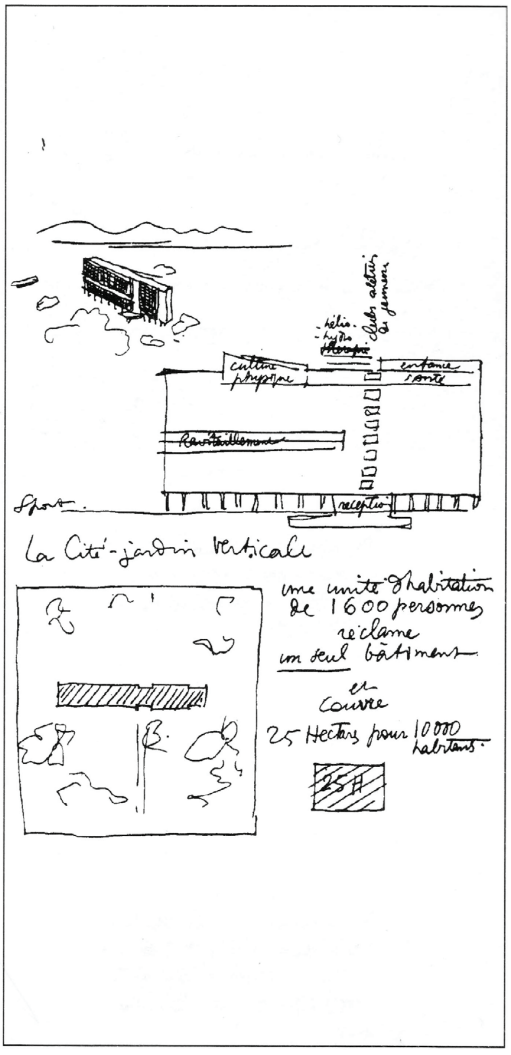
12 Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.*, p. 175.

13 Following a visit to New York in the late 1935, Le Corbusier addressed a strong criticism to the urban model of the American city. He described skyscrapers as being old-fashioned, piled up and oppressive to the pedestrian. His observations are detailed in the book *Quand les cathédrales étaient blanches* (1937).

14 Le Corbusier, *Quand les Cathédrales étaient Blanches,* Éditions Plon, Paris, 1937, p. 62.

15 *Ibidem,* p. 62.





Unité d'Habitation, Axonometry with the 7 internal streets;
Conceptual Sketches - density

Source: Jacques Sbriglio, L'Unité d'Habitation de Marseille (1992)

building and/or city
recreating the city / neglecting the city[16]

As mentioned above, Le Corbusier imagines his model of *self-contained urbanism* as being independent from the context and thus possible to be placed in non-dense areas, surrounded by generous green spaces. The *Unité d'Habitation* bears the exploration of the idea of *urbanity* within a building[17], which eventually means translating urban elements of the city – the street, the square, the park – into an architectural vocabulary and incorporating them within an enclosed container. Because of its *urban* scale, the *Unité d'Habitation* is often described as being analogue to a small village planned within enclosed boundaries: *"Il s'agit d'un morceau de ville qui répond au jeu fonctionnel urbain moderne (...)"*[18]. Yet, in the specific case of this building, the challenge is even more radical: the building intends to recreate a dense living environment while being completely independent from the urban density of the city.

Indeed, the challenge that hides beneath the conception of Le Corbusier's *Unité d'Habitation* is possibly one the most complex challenges of architectural conception: envisioning a total disconnection from the city and yet conceiving an object that intends to be a city-like building; to replace the city; ultimately, to be the city itself.

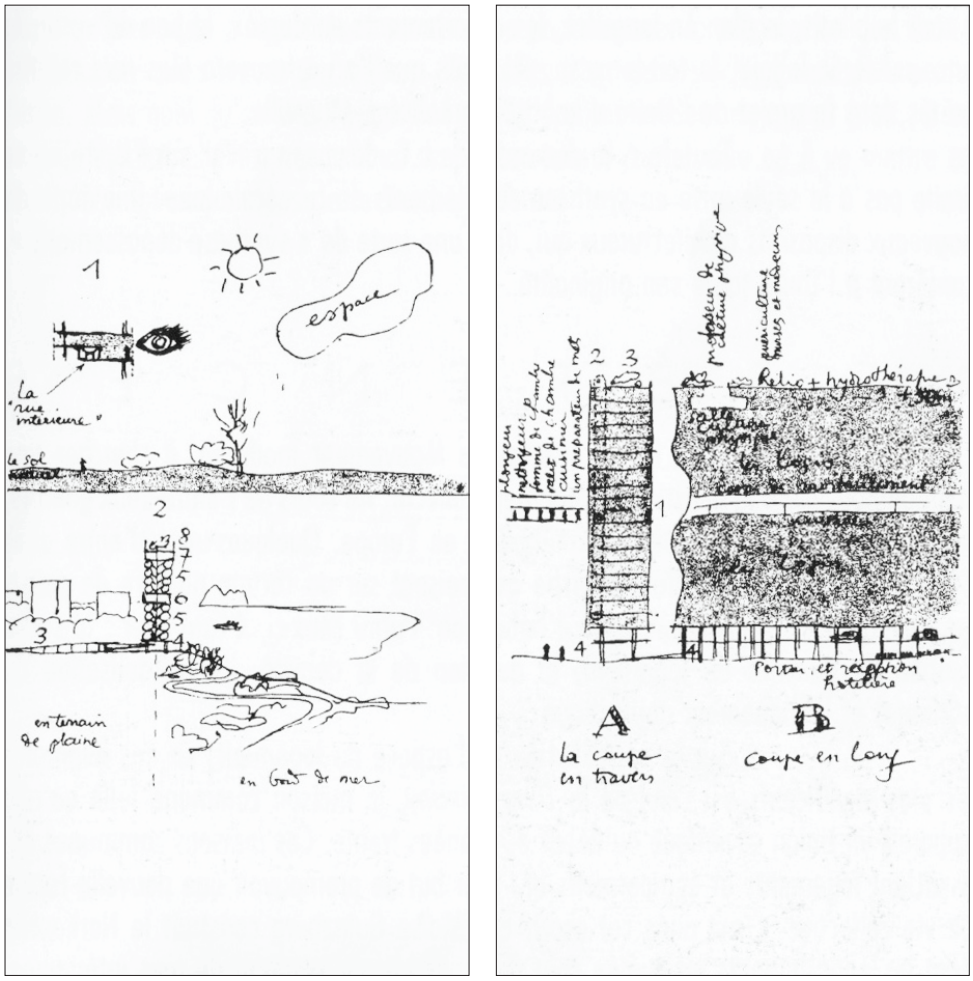
Scott Johnson develops this idea, explaining the fundamental conceptual difference between the skyscraper and the Unité d'Habitation: *"As a physical program, Le Corbusier's conception of the tall building was the antithesis of the Manhattan skyscraper. Whereas in New York the densities and cumulative qualities of the extant city, the infill nature of towers and the fact that the success of the pedestrian ground plane relied on a full range of programmatic events in the base of tall buildings, the logic of Le Corbusier's towers reversed this paradigm, conceptualizing the skyscraper as a single programmatically complete object, suitable in a theoretical urban landscape of gardens and arterials. Unlike New York's co-dependency between tower and city, Le Corbusier's tower became the city as object, and was freed to redraw its relations with other urban systems, namely nature and transportation."*[19]

16 Philippe Panerai, Jean Castex and Jean-Charles Depaule, *Formes Urbaines – de l'îlot à la barre*, *op. cit.*, p. 131: *"(…) la cité Radieuse exprime le refus de la ville"*.

17 As we speak of 'urbanity' to define the *Unité d'Habitation*, its use can become ambiguous for we must always seek an accurate understanding of what, in architecture, belongs to the city and what belongs, to the building. As stated by Françoise Véry in the preface of Jacques Sbriglio's book, one shall avoid the risk of using 'urban' as an adjective. The truth is that we often use the term 'urbanity' to describe the features of architectural buildings while urbanity refers however to what belongs to the city, to what contains "the qualities of the man of the city" - but not to the 'forms of the city'. That is to say that urbanity could not directly translate the formal features of the building, in the sense that was an inadequate term when applied to architecture. Read more in Jacques Sbriglio, *Le Corbusier, L'Unité d'Habitation de Marseille, op. cit.*

18 *Ibidem.*

19 Scott Johnson, *Tall Building: Imagining the Skyscraper*, Balcony Press, Glendale Calif., 2008, p. 20.



Schematic sketches of the Unité d'Habitation fundamental ideas like the interior street, the view, the sunlight, the rooftop use, are represented in these sketches

Source: published in *Propos d'Urbanisme*, 1946

The complete reversal of strategy that is operated within the *Unité d'Habitation,* when compared to the traditional city, is interestingly summarized in the comparative chart below[20], allowing for a quick identification of the mutations occurred within each different urban element:

	TISSU TRADITIONNEL	LE CORBUSIER
L'ACCÈS AU LOGEMENT	EN FAÇADE ET À L'AIR LIBRE	AU CENTRE ET OBSCUR
LE COMMERCE	REZ-DE-CHAUSSÉE SUR LA RUE	ÉTAGE DANS UNE GALERIE
LES ÉQUIPEMENTS	REZ-DE-CHAUSSÉE SUR RUE OU EN FOND DE PARCELLE	AU SOMMET (MATERNELLES) OU AILLEURS
L'ESPACE LIBRE	INTÉRIEUR ET CACHÉ (LES COURS)	EXTÉRIEUR ET VU (LES PILOTIS)
LA RUE	EXTÉRIEURE	INTÉRIEURE

Being the first built project of L.C. at a scale of urbanism[21], the *Unité d'Habitation* embodies indeed a mini city-structure (conceived for a pre-established number of inhabitants). It associates functions of living, education and commerce within a unique envelope, inviting *urbanity* to sparkle within the building. However, it is indeed in this concept of 'urbanity' that the *Unité d'Habitation* sets apart form other models: *"Sans occulter le double jeu de l'urbanisme et des villes, inscrit dans toute l'architecture de Le Corbusier, une fois décelée la double origine actuelle de l'urbain, l'urbanité comme qualité humaine de la civilisation urbaine permet de déployer toutes les valeurs que l'Unité d'Habitation intègre et restitue de l'art à la civilité."*[22] The fact that the building is not only lifted but also set apart from the city sets this idea of *urbanity* in a different position, since 'urban elements' – street, square, park – are replaced by equivalents, yet built within enclosed spaces. Is it really possible to plan urban elements of equivalent qualities and really recreate 'urbanity' within walls? *"On est tenté de penser qu'un tel bouleversement interdit à la pratique de se développer selon les habitudes établies, et le projet social de Le Corbusier comporte bien la modification complète du mode de vie des habitants. Toute référence à une vie urbaine, la vie de quartier traditionnelle, abolie: plus de "coin", "d'en face", "d'à coté".*[23]

the corridor street

"Nous avons, bien entendu, supprimé la "rue-corridor", la rue de toutes les villes du monde. Nos maisons d'habitation n'ont rien à voir avec les rues. Plus que cela, nous avons pris (sans malice), le contre-pied des tendances actuelles qui visent à faire courir les piétons sur des passerelles, en l'air, et à faire rouler les voitures sur le sol."[24]

20 Philippe Panerai, Jean Castex and Jean-Charles Depaule, *Formes Urbaines – de l'îlot à la barre*, *op. cit.,* p. 134.

21 See Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.,* p. 173.

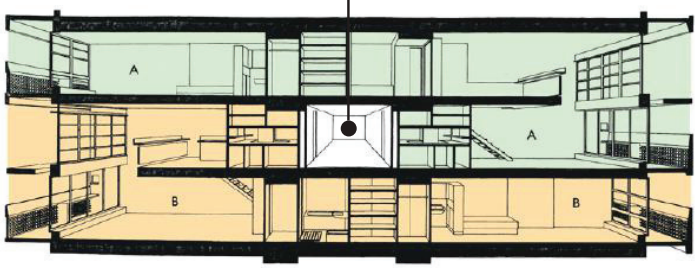
22 *Ibidem.*

23 Philippe Panerai, Jean Castex and Jean-Charles Depaule, *Formes Urbaines – de l'îlot à la barre*, *op. cit.,* p. 134.

24 Le Corbusier, *La ville radieuse*, op. cit., p. 107.

Source: https://instantinspirationtogo.files.wordpress.com/2014/03/corbu3.jpg

Source: http://www.archello.com/sites/
default/files/imagecache/header_detail_large/



Unité d'Habitation, Corridor Street and Commercial zone
Source: http://www.building.co.uk/Journals/Graphic/f/f/l/CORBGRAPHIC.jpg

"A mi-hauteur, se trouvent les services communs correspondant aux besoins des 1500 à 1700 habitants"[25].

The *internal street*[26] that Le Corbusier extracts from the *paquebot* acts as key backbone to allow an efficient interior articulation of uses and dwellings: it is said to promote meeting and encounter, to connect and to articulate horizontally the *vertical city* while still ensuring the respect for the intimacy within each dwelling - in a logic that mimics the one of the archetypal *street&house* model[27]. The introduction of a horizontal circulation system within a high-rise housing scheme is undoubtedly an interesting feature of this building, with much greater potential than the simple vertical core: "*alternating corridors at every third floor became more populated and sociable*"[28]. However, can we really say that this corridor replaces the *traditional street*? What kind of features should such corridor have in order to actually attain the qualities of a street?

The comparative chart that we have seen above indirectly focuses on the *street* and on the strangeness it undertakes within the *Unité d'Habitation,* as it loses its original character of bond between building and city - *"La Rue intérieure ne fonctionne ni comme un palier – elle dessert trop d'appartements – ni comme une rue (absence de fenêtre, de vis-à-vis, interdiction de jouer, etc.)*[29] to become a strange, inescapable pathway[30]. It denounces as well its discrepancy with the traditional city –"*au centre et obscure*" – while it still behaves as distributor to the multiple house entrances and also to commerce.

This sends us back to the primordial model of mix and to the idea of commercial activity as key activator of urban life (transversal to the different cultural and social standards). Indeed, one of the most criticized features of the *Unité d'Habitation* is the fact that its commercial street is inserted mid-height in the building, opposing the tradition of locating retail at street level as form of rooting the building to the urban ground; a feature that proved to be under-utilized and was relocated

25 « Unité d'Habitation Le Corbusier à Marseille », in *L'Architecture d'Aujourd'hui*, nº 46, February-March 1953, Bologne, p. 13.

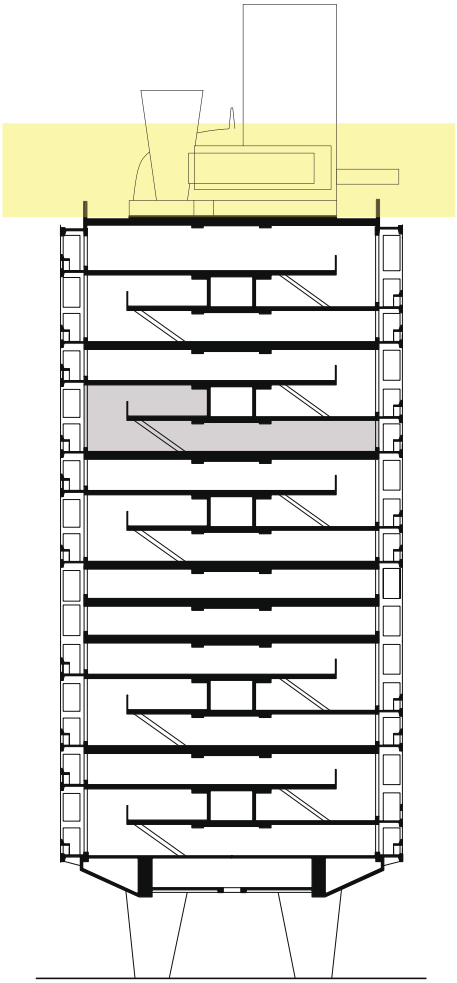
26 *"La rue intérieure se trouve déjà dans les projets de l'ilôt insalubre (1936) et même dans d'autres plus anciens. L'isolement du sol est la réalisation d'une idée que Le Corbusier poursuit depuis 1915 (…)".* in Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.*, p. 174.

27 *« Dans ce village vertical de 2000 habitants, on ne voit pas son voisin, on n'entend pas son voisin, on est une famille placée 'dans les conditions de nature' soleil, espace, verdure. C'est la liberté acquise sur le plan de la cellule, l'individu, le groupe familial, le foyer. Au plan du groupe social, c'est un bénéfice des service communs confirmant la liberté individuelle. » Discours inaugural de Le Corbusier à la cité Radieuse de Marseille, in Jacques Sbriglio, Le Corbusier, L'Unité d'Habitation de Marseille, op. cit.*

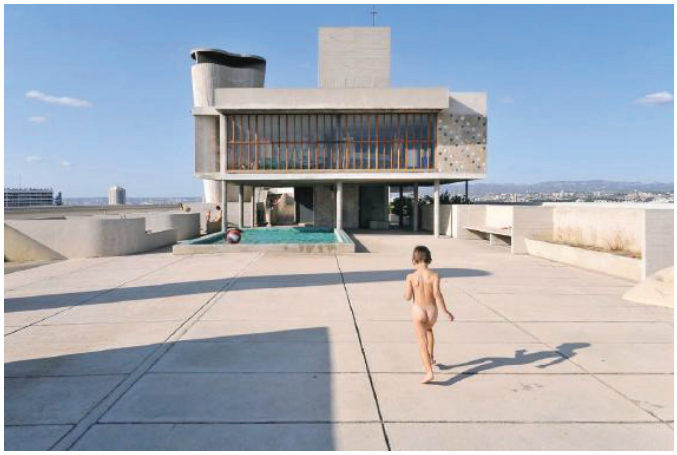
28 Scott Johnson, *Tall Building: Imagining the Skyscraper*, *op. cit.*, p. 62.

29 Jacques Ion, *Production et pratiques sociales de l'espace du logement*, Cresal, St. Etiènne, 1975, p. 108.

30 *Ibidem*, p. 108: *"La rue intérieure est un point de passage cosmopolite obligé".*



Section 1:500
Source: Hilary French, 2008.



Unité d'Habitation, terrace
Source: https://pbs.twimg.com/media/

in subsequent projects to the ground floor[31]. How can indeed commerce work successfully when completely detached from urban life and the street? "*Dès la conception de ce centre commercial "en l'air", L. C. sera interpellé par la critique qui lui rapprochera d'avoir localisé ces équipements à mi-hauteur pour des raisons tenant à un simple formalisme de façade. Il s'en défendra en argumentant que cette localisation au milieu de l'Unité était la seule susceptible de permettre aux habitants de partager les trajets*."[32] Indeed, Lewis Mumford has been one of the authors to preconize this criticism when, after visiting the Unité d'Habitation; he described it as empty and dull : « *la rue commerçante est totalement vide, macabre, comme une vision des Carceri de Piranèse »*[33], and disregarded the fact that the innovative character of the scheme would necessarily require some time before tenants would have taken the risk of buying those new spaces. Whether it follows formalistic motivations or whether it really intends to trigger different forms of familiarity between inhabitants, the fact that commerce is located at the heart of the building increases the complexity of the scheme [34]; suddenly, any stranger or passer-by could be allowed to enter the building and to shop amidst its inhabitants. However, the fact that it is located mid-height in the building simply makes it unperceivable to the public outside, and thus its use is automatically limited to a restricted number of inhabitants.

The truth is that, with time and appropriation, eventually the inhabitants took over the maintenance of the common areas, using it as familiar areas for the community within the building: "*les espaces servent aux contacts sociaux entre residents*".[35] Eventually users have created an association to take care of the management of the common services; they received their hosts at the hotel café, they met at the terrace while their children played, etc[36]. The model has become an important laboratory for the development of a form of community life within a building – a somewhat successful paradigm of self-contained city - as the residents have seemingly responded to the idea of community that was implicitly suggested by the architecture.

31 Scott Johnson, *Tall Building: Imagining the Skyscraper*, *op. cit.*, p. 62.

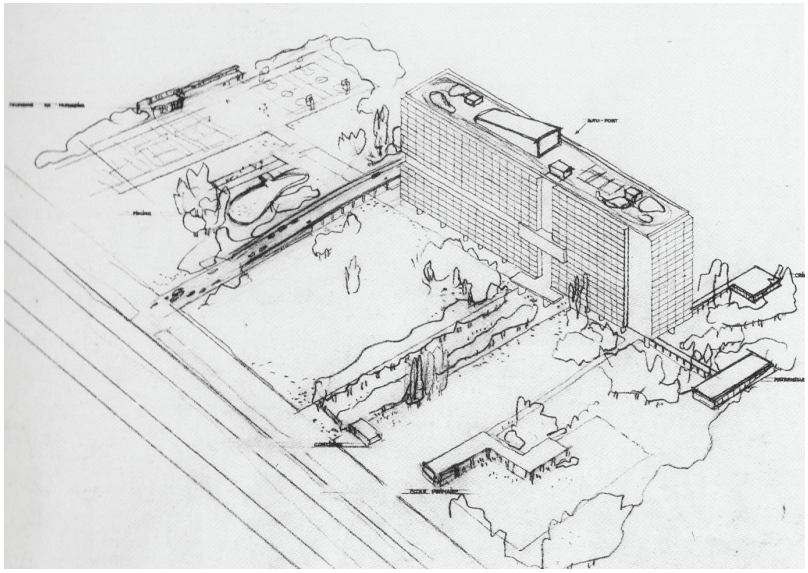
32 Jacques Sbriglio, Le Corbusier, *L'Unité d'Habitation de Marseille, op. cit.,* p. 97.

33 See Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.,* p. 177.

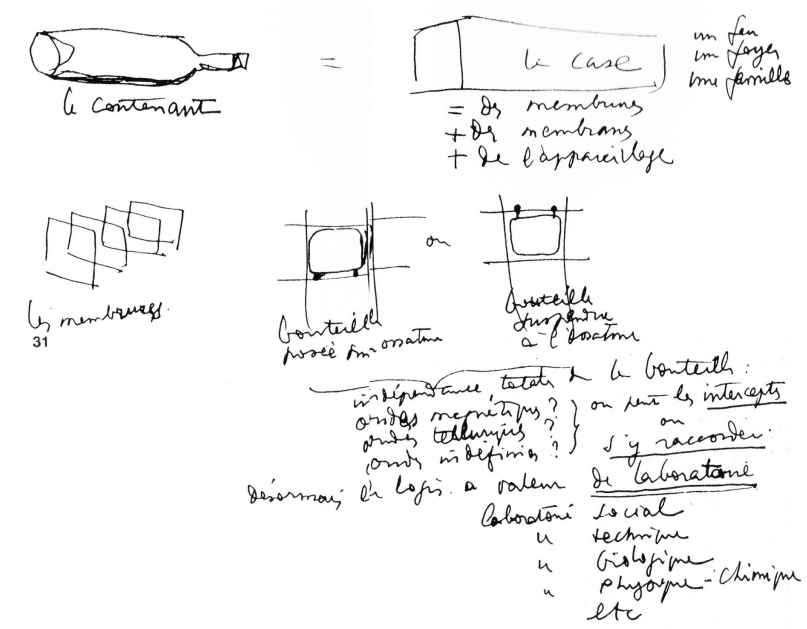
34 The control of intimacy of this mixed housing building could have been difficult. However, the design and interior organization seem to be cleverly planned, avoiding conflicts of this kind and allowing different levels of intimacy within this "city within a building".

35 Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.,* p. 177.

36 *"Il se trouve qu'à Marseille, les habitants de l'Unité ont effectivement formé cette sorte de communauté que suggère l'architecture. Ils se sont réunis en une association qui régit les équipements communs et anime à l'occasion les contacts amicaux. Au café, dans le petit hôtel, les habitants peuvent rencontrer leurs hôtes. On peut acheter tout ce qui est nécessaire au foyer dans les magasins de la rue commerçante. Face au paysage homérique des Alpilles, la terrasse (…) offre aux enfants un agréable terrain de jeux (…). Ces équipements servent sans doute aux enfants, mais à travers eux, ils servent aux contacts sociaux entre résidents." in* Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.,* p. 177.



Unité d'Habitation - preliminar project 1946 - reference to the 'auto-port'
Source: Jacques Sbriglio, *L'Unité d'Habitation de Marseille* (1992)



Sketches of the Unité's principle as 'the bottle and the wine bin'; the individual apartment is the 'bottle' capable of being stowed in the building frame in any required position
Source: sketch published in *Oeuvre Complète*, 1946-52

parking

Although parking isn't part of the final design of the building – there's an open air contiguous parking area, linked to the entry of the building by a 'casquette' -, Le Corbusier acknowledged already the car as a fundamental device on the daily life of the modern society. However, some modern principles, such as the separation of pedestrian and car circulation, prevailed on most of his designs. In that sense, in some initial designs of the *Unité d'Habitation* in 1945, one can see traces of the '*autoport*' imagined by Le Corbusier: an adjoining structure located at a lower level. "*A la côte, -3,50m au-dessous du sol naturel, des emplacements pour bicyclettes et voitures d'enfant sont aménagés, de même que des garages pour automobiles. Une rampe s'élève au-dessus de la voie d'accès à l'autoport, situé côté est, sur la façade arrière. Elle assure ainsi la différenciation des circulations auto et piétons, et vient desservir un entresol situé à la côte +2,50m*"[37].

the typological mix

The *Unité d'Habitation* contains a total of 337 apartments, anchored alongside the corridor street, being often compared to a '*bottle holder*'[38] for individual home types, as it contains indeed a remarkable variety of dwellings within the regularity of its volume: « *Dans l'unité d'habitation de Marseille, les trois cent trente-sept appartements connaissent vingt-trois variantes, de la chambre d'hôtel à l'appartement pour familles de quatre à huit enfants* »[38]. For L.C., the bottle is no longer a synonym for a construction process, but becomes a metaphor of the container of the family; that bottle is composed of "organs" and is inserted in the "*supporting frame of a veritable bottle rack, known as bouteiller*" [39] - a strategy for optimizing the construction while still ensuring the diversity of homes: *"concillier les avantages d'une standardisation poussée à une diversité largement suffisante pour répondre à la variété des besoins"*[40]. However, beyond the acknowledgement of possible different family types, we cannot really say that the subject of social mix – in terms of bringing together different social levels – has been a central preoccupation for Le Corbusier. It seems to be rather the idea of 'play'[41], as an intellectual challenge, opposed to the standardized repetition of dwellings within the skyscrapers, that drives the work of the architect.

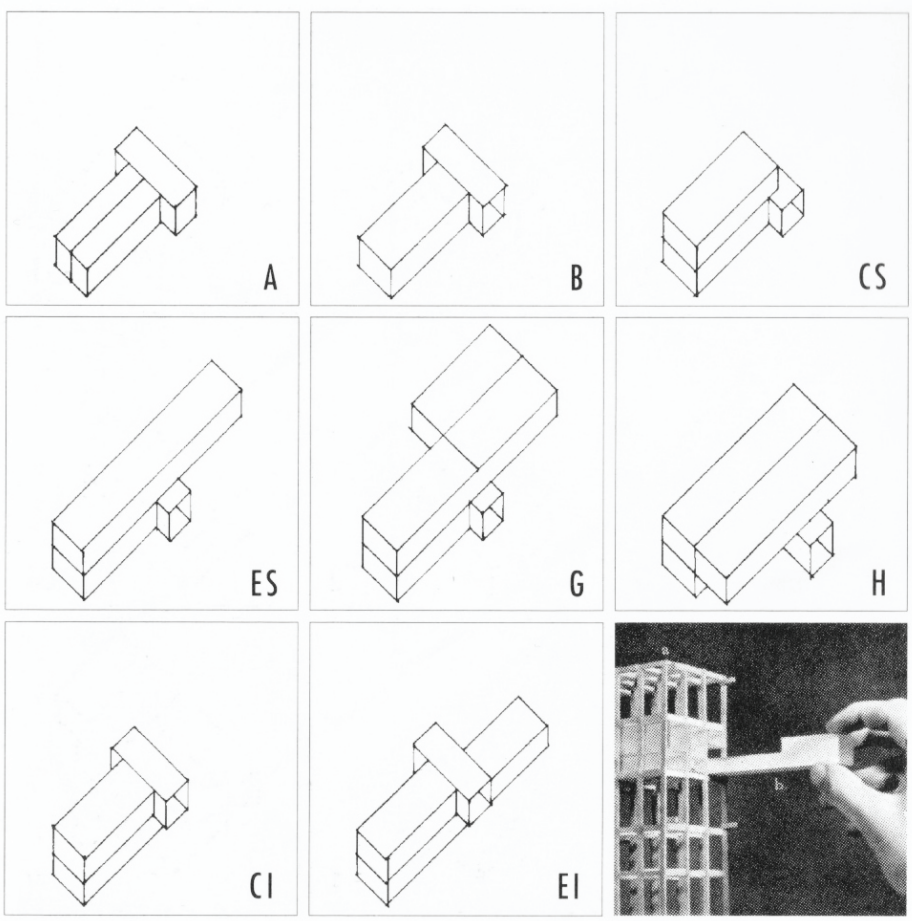
37 Jacques Sbriglio, Le Corbusier, *L'Unité d'Habitation de Marseille, op. cit.,* p. 37.

38 Stanislaus von Moos, *Le Corbusier, l'architecte et son mythe*, *op. cit.,*, p. 174: "*séparés, les logements sont disposés dans l'ossature en béton armé comme des bouteilles dans un casier.*"

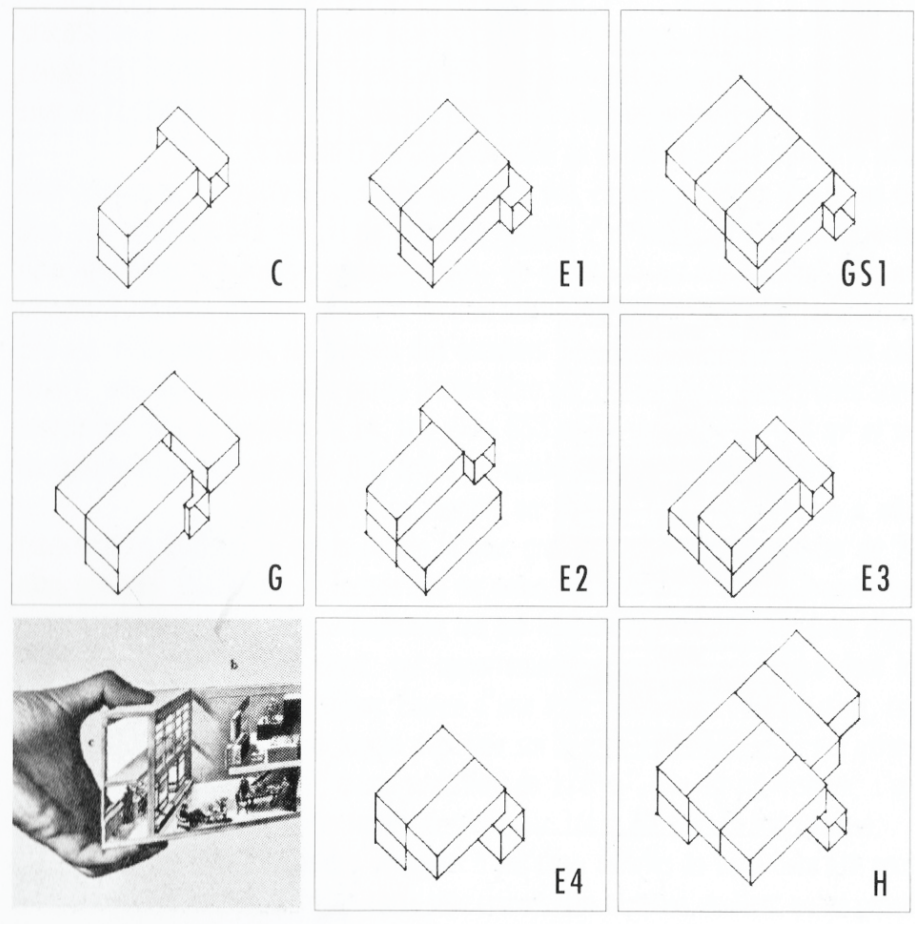
39 See Roberto Gargiani, Ana Rosellini, *Le Corbusier: Béton Brut and Ineffable Space*, 1940-1965, EPFL Press, 2012, p. 6.

40 Le Corbusier, "Unité d'Habitation de Marseille", *L'Homme et l'Architecture*, nº special 11-12-13-14, 1947, p. 75.

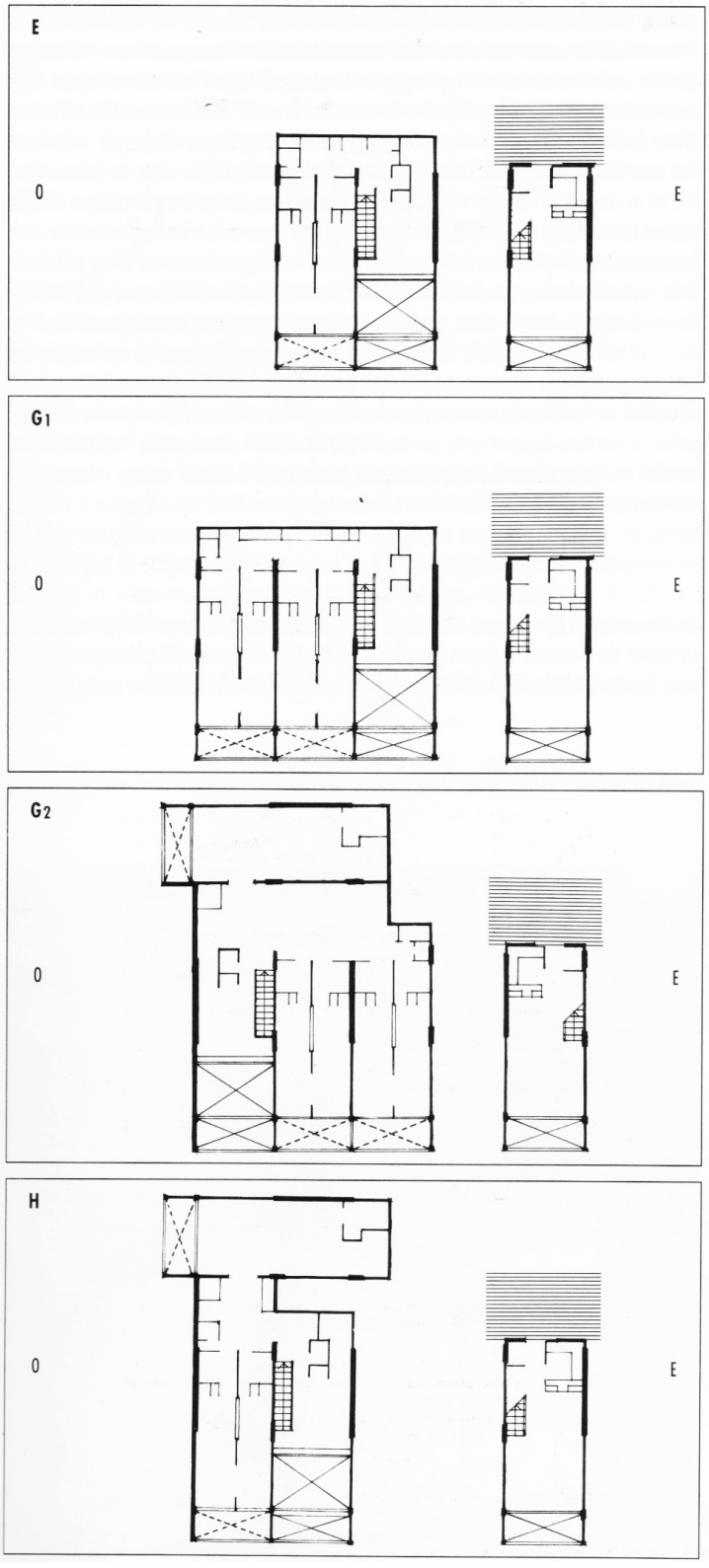
41 See Bruno Marchand and Christophe Joud, *MIX*, PPUR, Lausanne, 2014, pp. 30-32: *"Tous les projets corbuséens de l'entre deux guerres qu'on vient d'analyser procèdent de l'intêret que L.C. à toujours eu par le jeu en tant que manifestation de l'esprit et, dans ce cas précis, pour les imbrications typologiques et l'exploitation de leur potential spatial."*



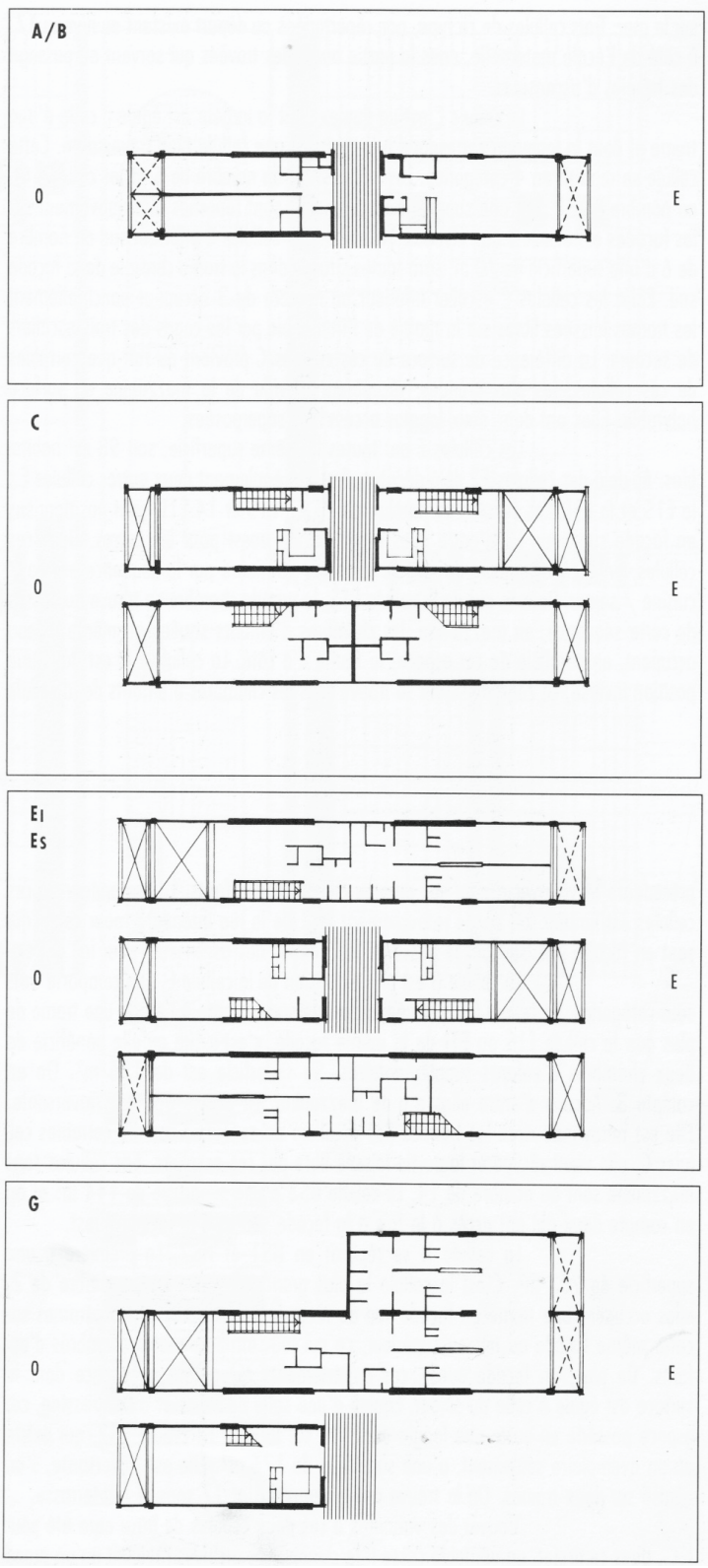
Unité d'Habitation, Mix of living cells
Source: Jacques Sbriglio, *L'Unité d'Habitation de Marseille* (1992).



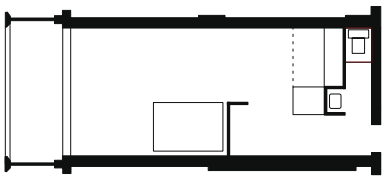
Unité d'Habitation, Mix of living cells
Source: Jacques Sbriglio, *L'Unité d'Habitation de Marseille* (1992).



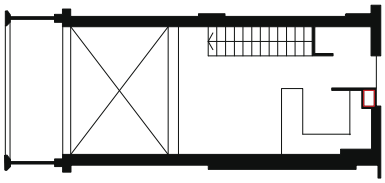
Unité d'Habitation, Mix of living cells
Source: Jacques Sbriglio, *L'Unité d'Habitation de Marseille* (1992).

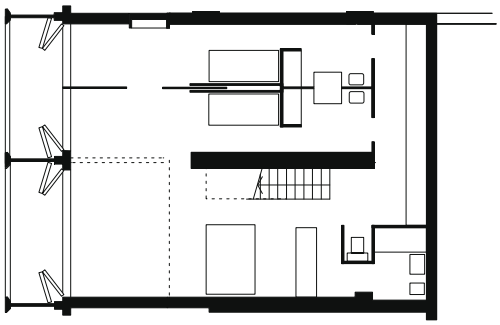


Unité d'Habitation, Mix of living cells
Source: Jacques Sbriglio, *L'Unité d'Habitation de Marseille* (1992).



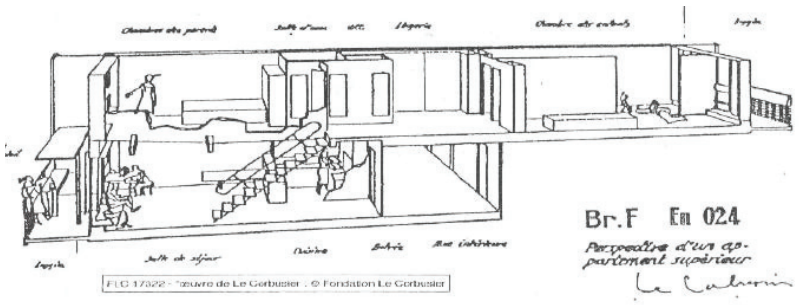
Type E1 single-person studio flat plan 1:200



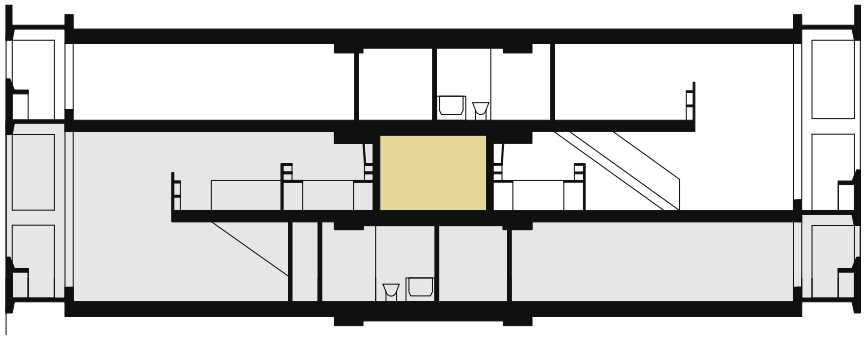


Maisonette for family with 2-4 children 1:200
Lower & Upper level

Unité d'Habitation, Le Corbusier, Marseille, 1952
Source: base plans by Hilary French, 2008.



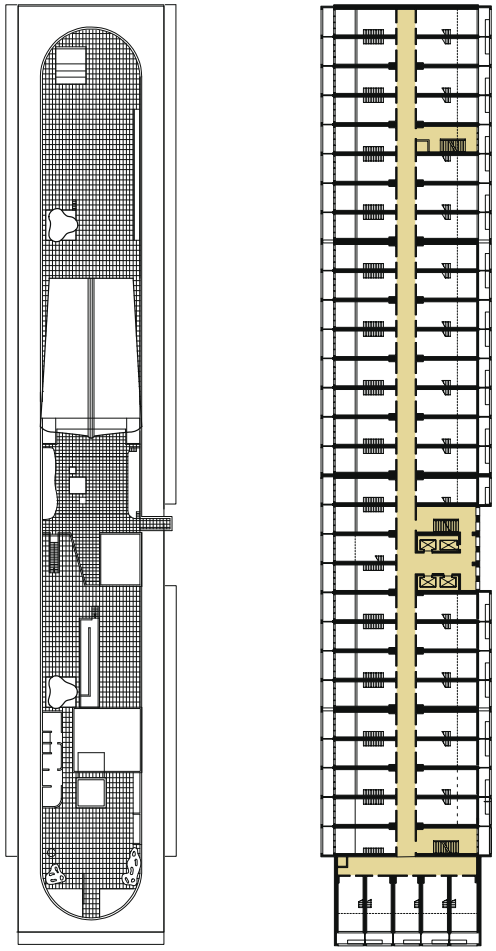
Source: Jacques Sbriglio, *L'Unité d'Habitation de Marseille* (1992).



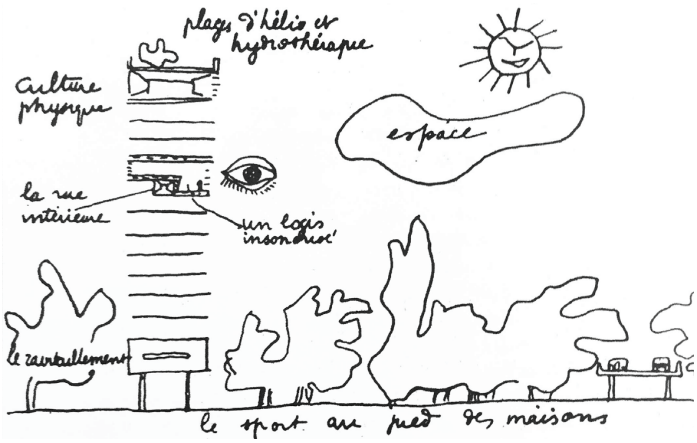
Pair of Maisonettes for family with 2-4 children - Section 1:200

Pair of Maisonettes for family with 2-4 children - Plans 1:200

Unité d'Habitation, Le Corbusier, Marseille, 1952
Source: base plans by Hilary French, 2008.



Roof Plan 1:1000 & Plan of Typical Access Floor 1:1000
Source: base plans by Hilary French, 2008.



Le Corbusier, didactic section including the «eye that sees» (explanation of the Unité d'Habitation)
Source: *La ville radieuse* (1935)

The variety of flats focuses rather on ensuring the architectural qualities of each dwelling. This variety of dwelling types is revealed by the nomenclature system used by Le Corbusier: *"cellules montantes, cellules descendantes, cellules traversantes, etc"*[42], most of them being vertical duplexes with maximized natural light and ingenious interiors.

At the d'*Unité d'Habitation*, the apartments are oriented West-Est, with views on both façades, except for the Southern part of the building where the apartments are oriented South[43]. The standard apartment at the *Unité d'Habitation* is designed for families with two children. Being the most private spaces, the bedrooms' areas are kept to the absolute minimum, giving more area to the kitchen/living room. Despite their small dimensions (only 3,66 m width), the apartments extend the full depth of the block, with balconies on both sides for sunlight and view. Variations on this base typology include the addition of a second pair of bedrooms (for bigger families), single –aspect apartments for couples and studios (the only type without double height)[44]. For the way of accessing (interior street), to the double height, double view and inner qualities of the apartment, it might be fair to say that the qualities of the suburban villa were guaranteed within this high-density scheme.

the contribution of the Unité d'Habitation to our research on the Big Building

The conception of the *Unité d'Habitation* is radical and innovative as it tests the transposition of an interestingly complex urban logic (the village/ the urban diversity/ the city fabric) to the interior organisation of a building, enabling the advent of remarkable social phenomena. As noted by Giedeon, « *le coté exemplaire de l'Unité d'Habitation réside dans l'association d'une « imagination spatiale » et d'une « imagination sociale* »[45]. Le Corbusier's *Unité d'Habitation* bears indeed a fundamental paradigm to our research for it nourishes our reflections and our fundamental exercise of definition of a 'Big Building' in its multiple different levels – the relation between the building and the city, the density[46], the program mix, the typological mix, the mix of habitat and urbanism (two topics that have been central and yet disconnected in most of Le Corbusier's reflections), the scale and independence between the contained and the container, and mainly, the development of social interactions – normally belonging to urban contexts – within a building.

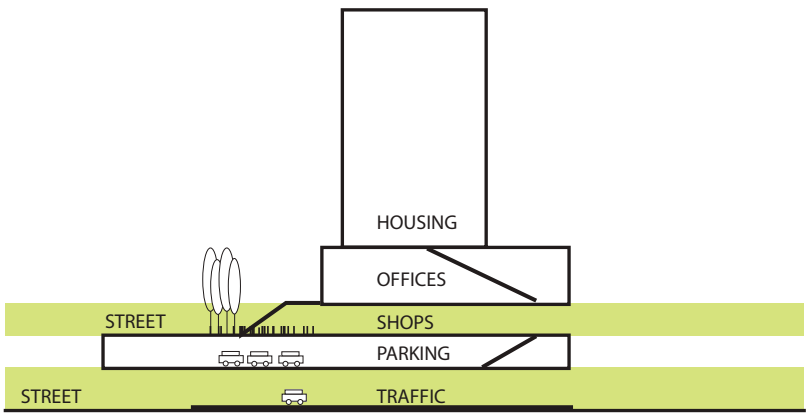
42 Jacques Sbriglio, Le Corbusier, *L'Unité d'Habitation de Marseille, op. cit.,*p. 85.

43 « Unité d'Habitation Le Corbusier à Marseille », in *L'Architecture d'Aujourd'hui*, n. 46, February-March 1953, Bologne, p. 13.

44 Hilary French, *Key Urban housing of the twentieth century*, King publishing, London, 2008, p. 82.

45 Sigfried Giedion, *Space, Time and Architecture*, Harvard University Press, Harvard, 1941, p. 547.

46 See Roberto Gargiani, Ana Rosellini, *Le Corbusier: Béton Brut and Ineffable Space*, *op. cit.,* p. 6: *"The Unité d'Habitation it is the first prototype in the doctrine of urban planning and architecture, with which Le Corbusier intends to demonstrate the effectiveness, with respect to a land allotment providing the same number of units, of that concentration of villas in a single block he had already theorized in 1910 and 1922 (immeuble-villas) – a contemporary vision of the chateau de Chambord".*



Source: Author Diagram.

2.2.4. Vertical Urbanism (*Urbanisme sur dalle*)
The Vertical Stacking of functions and Urban Elements

The *Unité d'Habitation* has surely been a fundamental base reference to an extensive number of projects conceived during the second half of the twentieth century. As we have seen in Chapter I, the concept of *street-in-the-air* has been explored by Alison and Peter Smithson or Georges Candillis and Shadrach Woods, departing from L.C.'s concept of *elevated street*, as they simultaneously supported the idea of self-sufficient residential and commercial elements assembled around multipurpose structures which themselves were clustered around transportation networks. Simultaneously, both the *Unité d'Habitation* and the Athens Charter have nurtured the development, in the late 1950s, of a model known as 'Vertical Urbanism' (or 'urbanism on slab'), a post-war architectural/urban strategy targeting the replacement of the traditional horizontal zoning of modern urbanism with a vertical zoning (a stratification of functions per level), allowing for repositioning the large-scale building back within the city fabric[1]. It goes beyond the concept of program mix or functional hybridity - although its base concept is still the one of mixing different functions within a unitary structure[2] - and recreates a set of tools that are closer to urban planning and its organizational strategies than to the architectural design itself.

grafting functions

The models of 'Vertical Urbanism' normally solve the issue of car circulation and parking at the ground and first levels – circulation is confined either under or over the ground (roads, car park, access to services - lifting shared public space by one or two elevated levels. The public is warmly invited to enjoy a new 'public space' and commercial activities - often even green spaces and plazas – at an upper level, within the city and yet detached from the congestion and the noise of the city. *"Like most districts built upon flagstone, it lacks connection to the classical urban fabric, standing in the city's centre, and yet also slightly to the side*"[3].

Despite its one-take construction and the coherent architectural treatment of the whole, complexes of this kind read rather as a 'grafting' of several different building types (whose functions one can often identify from the façade) rather than as a monolith. We could eventually reuse Joseph Fenton's term of 'graft hybrid', which he describes as "*grafting simple building types to one another*"[4] and in which different functions can still be perceived[5]. Within these complexes, housing is a

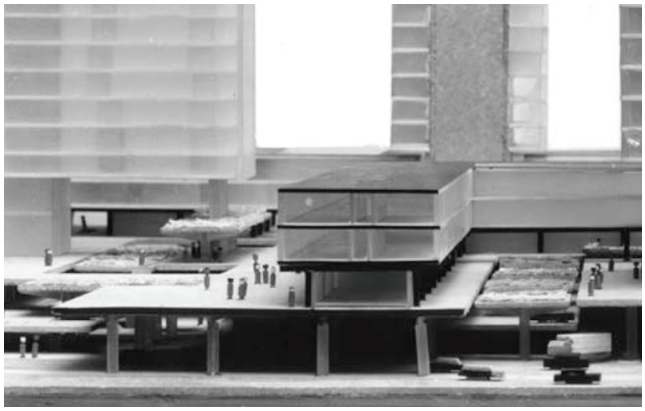
1 Inheriting some of the principles of modernism, these buildings are normally not built on the outskirts of the city (as, for instance, the social condensers), but rather in central areas.

2 "(…) *plusieurs fonctions distinctes sont comprises dans une seule structure*", in Jacques Lucan, *Où Va La Ville Aujourd'hui ? : Formes Urbaines Et Mixités*, Editions de La Villette, Paris, 2012, p. 22.

3 Olivier Namias and Jean-François Pousse, *L'invention de la Tour Europeénne*, Pavillon de l'Arsenal, Paris, 2009, p. 110.

4 Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, Princeton Architectural Press, New York, 1985, p. 8.

5 Within these organisms, the ensemble of buildings are indeed read as a unit - as complexes



Paris, Front de Seine. Raymond Lopez, Henry Pottier et Michel Proux, with Michel Holley architects. Study Model. 1963
Source: Jacques Lucan, *Où va la ville Aujourd'hui - Formes Urbaines et mixités*, 2012.

Michel Holley architects. Vertical zoning proposal: «Habiter, Travailler, Circuler».
Source: Jacques Lucan, *Où va la ville Aujourd'hui - Formes Urbaines et mixités*, 2012.

prominent program, and apartments are normally located at the towers (allowing for an optimization of the footprint, more views and privacy).

Such principles have somehow been theorized in the Buchanan report, published in London in 1963, having inaugurated the concept of "traffic architecture"[6], which supported the idea that buildings would no longer be placed along the streets. Instead, building and circulation would gradually become one and the same structure - an idea that later evolved into the megastructures[7]. Some of its fundamental principles can be listed below:

- automobile circulation at the ground level;
- car parking at the ground level and first floor;
- an exterior platform for shops and public circulation of people placed at the roof of the first floor;
- offices occupying the two or three levels above;
- housing at the higher buildings (towers).

The principles behind the 'urbanism on slab' have indeed led to a dramatic change in the form of conceiving urbanism and, ultimately, also architecture in the 1950s.

In 1959, in Paris, Raymond Lopez, Henry Pottier and Michel Proux have applied such principles to the project of the *Front de Seine* (in which the artificial floor of the slab is located 7 meters above the ground and the housing towers are 85 meters high): "*Un zoning vertical, qui apporte une réponse à la superposition parfaitement normale des fonctions humaines: habiter, travailler, circuler*"[8] and yet still heavily influenced by the spirit of the Athens Charter.[9] Indeed, these were the three layers forming the foundation for vertical planning. In the 1950s, "*it seemed to be one of the best ways to radically reshape the secular city to suit the needs of modern life.*"[10]

"The initial principles had been based on a separation of functions and traffic, a standardization of forms and dimensions. However, the spectre of a monolithic and uniform architecture, along with the growing criticism, led first to a diversification of the façades and then to a diversification of the volumes."[11]

where the different uses coexist and exchange, but we're still able to distinguish the different buildings as individual pieces, or even to guess the uses contained therein. Although these buildings do not bear the "object" character that characterizes the Big Building, they contain answers to most of the questions we rise within the subject (coexisting uses, housing quality, intermediary and circulation spaces, green areas, etc.).

6 Colin Buchanan, *Traffic in Towns, A Study of the Long Term Problems of Traffic in Urban Areas*, London, 1963, p. 46.

7 See Reyner Banham, *Megastructure – Urban Futures of the Recent Past*, Thames and Hudson, London, 1976.

8 Jacques Lucan, *Où Va La Ville Aujourd'hui ? : Formes Urbaines Et Mixités, op. cit.*, p. 23.

9 Jean-Philippe Hugron, "Out of Obscurity, Front de Seine and Totem, Paris", *A10 new European architecture*, 2007, p. 70.

10 Olivier Namias and Jean-François Pousse, *L'invention de la Tour Europeénne*, *op. cit.,* p. 110.

11 Jean-Philippe Hugron, "Out of Obscurity, Front de Seine and Totem, Paris", p. 70.

In this project, the grafting of 'envelopes' allows not only for identifying where the different functions are located, but even to identify different housing typologies in different towers: "*une tour de studios se présentera différemment de celle concernant de grands appartements*." [12]

A second time, in 1969, such principles have been applied to the *Olympiades*, also in Paris, conceived by Michel Holley. The author enhances the 'urban' character of these realisations: "*Rares occasions pour un architecte de créer ses propres règles d'urbanisme, de fixer son programme et de l'appliquer sur 500'000 m² dans le but d'intégrer la totalité des fonctions urbaines de type capitale – habitat de tout type, travail, équipements, sports, commerces, parkings, réseaux*"[13].

independence from the urban fabric

What is fundamentally interesting to analyse in these examples is that, beyond the idea of mixed uses or functional hybridity, these buildings inaugurate the idea of disconnection from the traditional urban fabric, replacing it with a whole new system (ultimately a new ground) and suggesting the creation of a new city life planned within built boundaries: a 'city within a city' – generator of life on its own, and no longer depending on the traditional street and public space.

These examples have, some decades later, been pointed out as problematic regarding their logics of co-property. Unlike the vertical mixed-use building, in which different floors can be managed and often owned by different entities, the raised public floors have been at the origin of issues of co-property and management that became complex. Nonetheless, these examples can be interesting references to the conception of the Big Building because they seem to result on successful schemes of coexistence and synergy between different functions, qualities of integration of multiple uses and landscape and, mainly, qualities of housing.[14]

12 Henry Pottier, Michel Proux, "Cinq tours d'habitation au front de Seine", in *Architecture Française*, 1971, pp. 76-77.

13 Quote by Michel Holley, in the presentation booklet of the project.

14 In recent years, new hybrid schemes - that are neither traditional urban operations nor architecture buildings - emerge in some European cities. In a recent analysis of urban operations occurring in Paris and other French cities, for example, Jacques Lucan identifies indeed mix (mixité) and diversity (diversité) as the main aim of all recent urban operations that he categorizes as "macrolots". Throughout the analysis of different case studies, Lucan concludes that housing is always mixed with multiple other programs and that, within housing, an effort is done towards a simultaneous integration of mixed housing typologies and categories (normal rental, affordable housing, social housing) and this mix is impelled by French building code (See Jacques Lucan, *Où Va La Ville Aujourd'hui ? : Formes Urbaines Et Mixités, op. cit.*). Moreover, such diversity reflects directly in the image/form of the building and translates into an effusive diversity of the façades. Although Lucan's research focuses more on the "morceau de ville", the city block, multiple fundamental issues and preoccupations can relate very directly to the ones of the Big Building.

The Barbican Centre

"a model for community life"

Amidst all the built examples of *vertical urbanism* developed during the second half of the twentieth century, the Barbican Centre, in the City of London (the 33rd borough of Greater London) deserves a special emphasis, being perhaps the most ground-breaking scheme of all large-scale central area redevelopments in Britain,[15] and also one of the most nourishing examples to our research on the simultaneous subjects of housing, density, mix, large-scale and complexity – the idea that it is indeed possible to conceive a complex building/building complex while still focusing on the well being of the residents. Above all, the Barbican is an epic project, where people desire to live - a highly desired artefact.

In 1951, Chamberlin, Powel and Bon - who had recently won the Golden Lane[16] competition[17] - have been commissioned to design a project of offices and housing, as way of regenerating a site that had been devastated in World War II[18]. The definitive project was approved in 1959 and the construction works began in 1960. The residential complex was completed in 1975 while the Barbican centre cultural complex was finished only in 1983[19]. The complex has been conceived as a high-density scheme, seeking, on the one hand, to respond to the urgent need

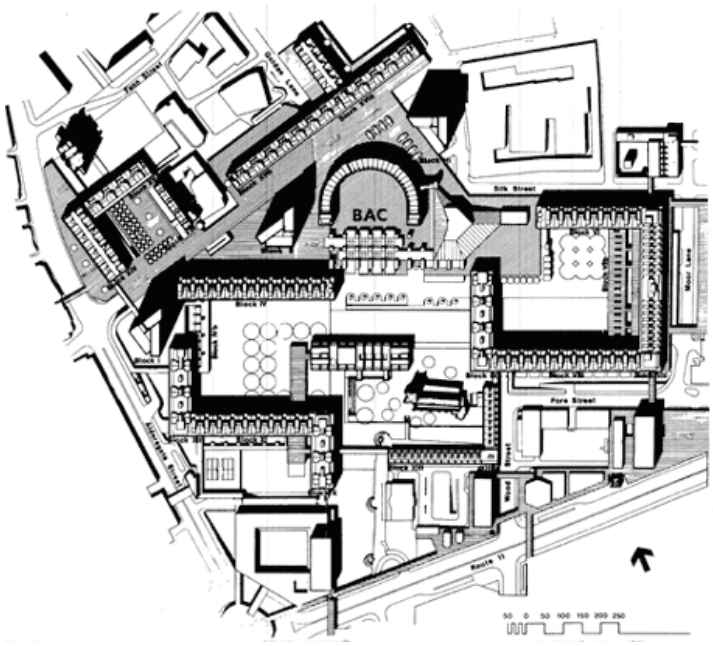
15 "*If someone had prophesized a few years ago that the City Corporation (of all people) would be promoting in 1959 Britain's most imaginative scheme for big-scale central area redevelopment, they would have been sent away to have their head examined*". Graeme Shankland, "Barbican and Elephant", *Architectural Design*, October 1959, p. 416.

16 "*Chamberlin, Powell et Bon exécutèrent le projet du "Golden Lane"(1954), avec ses parcours différenciés et un bloc élevé qui domine les constructions plus basses. L'idée des parcours différenciés est poussée encore plus avant dans les projets des quartiers « Park Hill » et « Hyde Park » à Shieffield : les voies réservées aux piétons se poursuivent à l'intérieur de la construction et, situées tous les trois étages des bâtiments hauts, forment la trame du quartier et en assurent la continuité.»* Giulio Segoloni, *Ensembles d'habitations économiques en Europe*, Ed. Eyrolles Paris, 1970, p. XII.

17 In the early 1950s, when they have been selected to develop the Golden Lane project, Chamberlin, Powell and Bon had little experience in building residential complexes – and yet they have set to work to find a solution of a highly urban character, avoiding the low-density solutions of the garden city. In many of its features, this building reveals clear parallels with the work developed by Alison and Peter Smithson, whose competition entry for the Golden Lane has had a huge impact on the design schemes developed at that time, mainly in regards to the circulation systems with "streets in the air", the wide circulation corridors (with nearly street width), the idea of continuous transformation, etc. To read more, see chapter I - Complexity and the Smithson's approach to *relational complexity*.

18 The Barbican Estate is located within the borough of the City of London, an area that was starting to lose residents since the mid XIX century due to an increase in office and land use. The lack of residents had turned it into an area with two different densities: over a million people used it every day yet from 6 pm on it became a ghost town. In the early 1940s , the World War II bombing destroyed most of the buildings and for fifteen years the area was a large wasteland used as playground by East End children. The first 1954 project proposals to the site involved a cityscape of office blocks with retail units on the ground floor. The interests converged to monetize the void by building offices. Nevertheless, a group of councillors, from within the City authorities aiming to incorporate housing into the area, fought and won the battle to alter the fate of the site. Read more in Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces,* a+t , Vitoria-Gasteiz, 2013, p. 222.

19 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, *op. cit.*, p. 223.



Barbican Estate, London, aerial view © Corporation of London

for housing and the lack of space in the city of London[20] and, on the other hand, to react against the peripheral garden city model[21]. The project was developed for a density of 200 people per acre[22], which was the maximum allowed density to be planned in the central districts of London at the time.

The importance of the Barbican to our research can be synthetized by listing the complex's fundamental qualities, confirmed throughout decades of use:

a) the successful articulation of multiple different uses within a large-scale complex;
b) the complex's simultaneous articulation and retreat regarding the surrounding urban density of the city;
c) the complexity of the multiple superimposed circulation axes;
d) the fact that it clearly illustrates the advantages and the joy of living in a dense mixed complex;
e) the housing mix and the quality of the different housing units;
f) the way car circulation and car parking are integrated within the complex;
g) the fact that the building has remained active and appealing throughout its almost 5 decades of existence.

functional mix

The Barbican estate is divided into two areas, separated by Beech Street: one to the south and the other to the north (between Beech Street and the Golden Lane Estate). The two areas occupy a surface area of 28.4 acres in the first case and 6.2 acres in the second case; a total of 34.6 acres (14 hectares). This includes a programme for 2'113 dwellings grouped in blocks up to seven storeys high and in three 43- and 44-storey towers. The density of the dwellings and the superimposed circulation spaces enable large areas of land to be left free for facilities and public spaces, of which 8 acres (3.2 hectares) is set aside for the Conservatory the water features and the gardens[23].

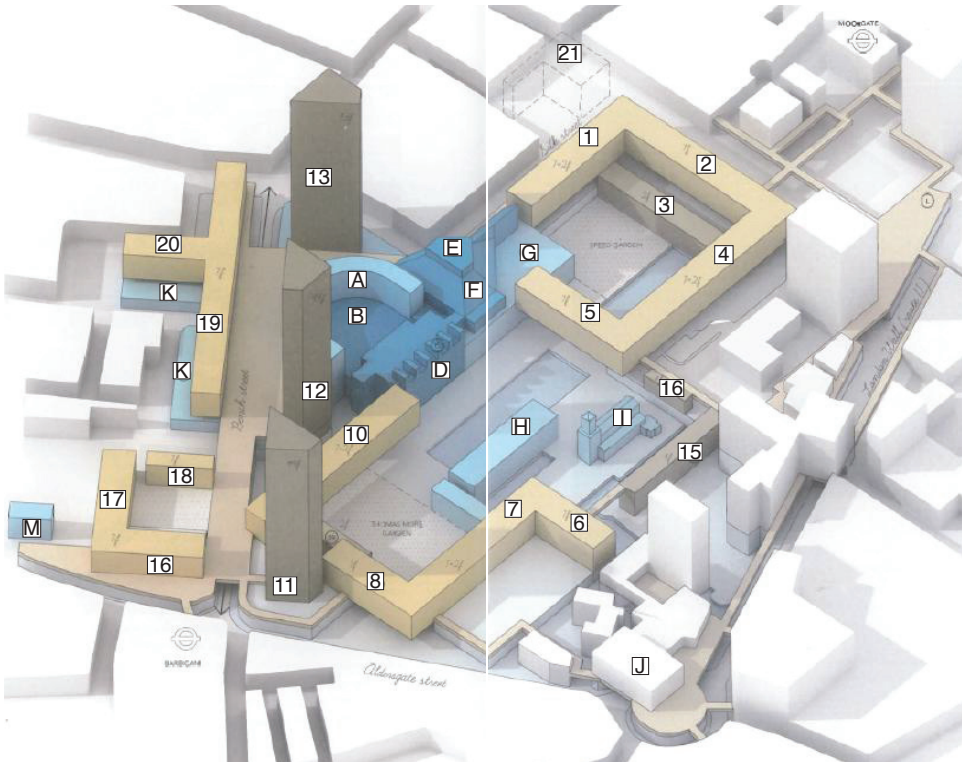
The Barbican Estate is mostly known as a ravishing cultural/residential complex, yet the multiplicity of programs it contains goes beyond that. It is composed by thirteen blocks of flats, businesses, youth hostels, leisure, educational, sports and

20 Tatsuya Tsubaki, « Model for a short-lived future? Tribulations of the Barbican redevelopment in the city of London, 1940 - 1982 » in *Planning Perspectives* Vol.27, London, October 2012.

21 The Doorn manifesto, developed by the Team 10 in 1954 - illustrated in the Patrick Geddes Valley Diagram "house-street-district-city" - synthesised the concept of creating a real community feeling within housing complexes – a denser way of living opposed to the peripheral garden city. The Smithson's used Geddes' Valley Section to devise a range of house types to suit different communities; the hamlet, the village, the town and the city. These designs were hugely influential, with a number of housing schemes taking inspiration from them. Such principles have certainly influenced the conception of the high-density urbanism explored at the Barbican.

22 CP&B proposed a density twice the one proposed in the Abercrombie Plan in the County London Plan (1943) for that estate, which was 100-135 people per acre.

23 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, *op. cit.*, p. 229.



HOUSING

01 SPEED HOUSE
02 WILLOUGHBY HOUSE
03 BRANDON MEWS
04 ANDREWES HOUSE
05 GILBERT HOUSE
06 MOUNTJOY HOUSE
07 THOMAS MORE HOUSE
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14 THE POSTERN
15 WALLSIDE
16 JOHN TRUNDLE COURT
17 BUNYAN COURT
18 BRYER COURT
19 BEN JONSON HOUSE
20 BRETON HOUSE
21 MILTON COURT (DEMOLISHED)

FACILITIES

A FROBISHER CRESCENT
B AUDITORIUM / CONCERT HALL
C ART GALLERY
D LIBRARY
E THEATRE
F CONSERVATORY
G GUILDHALL SCHOOL OF MUSIC
H SCHOOL FOR GIRLS
I ST. GILES CHURCH
J MUSEUM OF LONDON
K EXHIBITION HALL
L POST OFFICE
M YMCA

Source: *10 Stories of collective housing,* a+t research group, 2013.

cultural activities - all grouped around a lake and green spaces[24]. At the heart of the complex there's an important centre dedicated to art, theatre and business events. Within the complex, an elevated street connects the ensemble of public services of the Barbican[25].

The complex contains indeed most of the uses one could expect to find in a city (quality public space, water features and greenery), and these seem to function with fair synchronicity, hosting within its boundaries a *striking urban complexity* - a clear outcome of the clever mix of uses, common areas and connection paths. "*The plan was to crate structures which could assume the complexity of collective living. Basically, they wanted to recreate the solidity of Georgian London, the hustle and bustle of the medieval city and the peace and tranquillity of the suburbs, all in one single site and on the scale of a 2th Century metropolis. The most astonishing thing is they actually achieved their goal.*"[26]

The ravishing intensity of the complex originates mainly from the functioning of the Barbican Centre, a cultural centre spreading itself out over different buildings, interconnected by pedestrian platforms, lobbies and access points. In this zone of 'cultural accumulation', we find concentrated the Concert Hall, the Theatre, the Guildhall School of Music, the Library, the Art Gallery and the Conservatory. The conservatory is shaped around the theatre - an interesting strategy to deal with the spatial proximity between the theatre and the Gilbert House dwellings and the possible disruptions related to the noise and also a form of diluting the impact that the theatre volume could have on the complex due to its scale. The cultural nucleus is like a heart for the complex, bombing animation and cultural life and generating an interesting confluence of external and internal uses.

the podium and the relation with the city
"urbanly central, suburbanly private"

Despite its character of *cluster*[27] and its urban life taking place at an upper level, the complex is in many ways permeable and articulated with the city, while still safeguarding privacy – "*urbanly central, suburbanly private*".[28]A thrilling

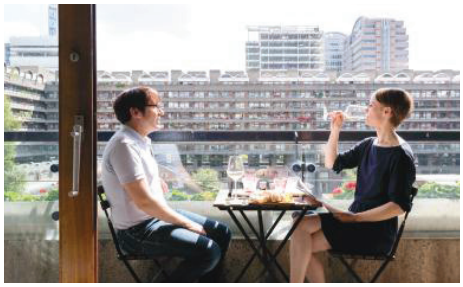
24 Barbican, brochure edited by Cement and Concrete Association, London, 1971.

25 Listed Building Management Guidelines, Barbican & Golden Lane Estate, edited in 2005 and 2007 then updated by City of London Corporation.

26 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, *op. cit.*, p. 272

27 The term 'Cluster' - specific pattern of association introduced to translate the idea of grouping or accumulation - "*is used to avoid association with the concept of the 'street'; a place that the Smithson's felt was outdated as the use of cars prevented the street from being a place for a resident to identify with their environment. This idea was translated into their project 'Golden Lane' (1952), a multi level project with housing occupying one side of wide 'streets in the sky', designed to provide residents with direct pedestrian access to activities, intended to give the community a strong sense of identity*". About the definition of 'cluster', read Alison & Peter Smithson, *Urban Structuring - Studies of Alison & Peter Smithson*, Studio View Ltd., London, 1967, p.33.

28 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical*



© Anton Rodriguez
Source: https://www.dezeen.com/2016/11/06/residents-inside-iconic-barbican-estate-homes-anton-rodriguez/

peculiarity of the Barbican is indeed its relation with the city. On the one hand, the building seems to be designed with the intent of merging with the city's density – a city within the city - articulating with it in many ways, not only in terms of the scale of its elements but also through its constantly porous openness to light and people. On the other hand, thought, being at the Barbican represents a whole new experience of urban density: protected from the noise and traffic, and offering the joys of suburban living: "*Uninterrupted by traffic, (…) people will be able to move about freely enjoying constantly changing perspectives of terraces, lawns, trees and flowers seen against the background of the new buildings or reflected in the ornamental lake*"[29].

This dual character of the building seems to be an outcome of a series of comprehensive design strategies developed by CP&B in early stages of the project. "*CP&B efforts to mix historic Italian piazzas with what were at the time new modern isolated block proposals led to an original and novel fusion of the semi-closed block over a podium with interconnected open spaces which attempted to continue on from the great British tradition of Georgian architecture*"[30].

The entire complex is erected from a perimeter podium, which is also one of the most distinctive and controversial features of the complex for the way it divides off the streets from the perimeter. This feature is accentuated by the different level between the north and the south ends of the estate which made it necessary to raise the podium by 3 meters on the north side due to the topographical characteristics of the land[31]. Consequently, the ground floor is not the same for all blocks, although all traffic meets at the arts centre. Within the site, though, space flows from East to West under the large columns below the housing blocks.

Yet, the architects' desire to establish a ravishing collective environment in articulation with the city is clear in the early conceptual sketches for the theatre: "*What is particularly striking about the plans of the Barbican is their consistent attempt to create a new living environment for Londoners. (…) From the plans for roof gardens with adjacent kitchens to concept sketches for the theatre that evoke the streetscapes of Italian cities, the architects, and their patrons, had a very clear idea about how people should live the good life*" [32]. In the sketch, the theatre is conceived as a building within in a "*pedestrianized Italianate urban space*"[33]. It has a roof garden at the top level and it seems to be designed as a building which is constantly

analysis of inspiring masterpieces, *op. cit.,* p. 254.

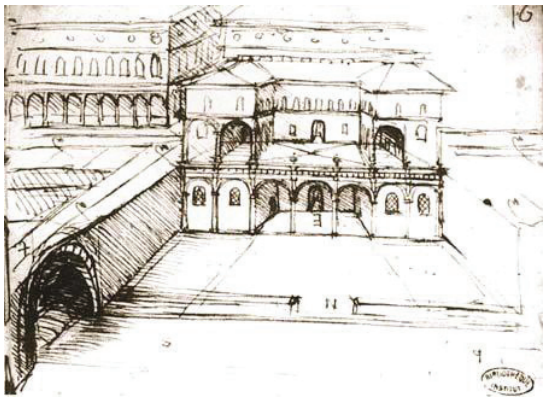
29 Chamberlin, Powell & Bon, *Barbican Report 1959*, Barbican Committee, Corporation of London, 1959.

30 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, *op. cit.*, p. 232.

31 *Ibidem*, p. 232.

32 David Heathcote, *Barbican, Penthouse over the City*, Ed. John Wiley & Sons Ltd, Chichester, 2004, p. 33.

33 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, *op. cit.*, p. 232.



Leonardo Da Vinci's early proposal for the *Ideal City* based on superimposed and segregated flow on upper and lower levels, stating that only the «*gentili uomini*» or pedestrians should transit the upper streets.

Source: *10 Stories of collective housing,* a+t research group, 2013.

porous to light and people – "*where ingress and egress become part of the life of the street*."[34] Although the sketch bears only a subtle relation to the final theatre design, it shows what the architects may have dreamed to create before facing the pragmatic reality of conceiving an arts centre within a large hole.

The entire built environment of the Barbican is erected on top of the podium - a platform that becomes the access base for the buildings. This elevated stage functions as a pedestrian street and it also serves as socialization area. For this reason, the ground floor in contact with the terrain does not correspond to the area where urban life takes place, which is on the upper level[35]. From this super-elevated position, one can look out over the open spaces and the lake in the same way that one could watch over the interior of a walled fortress from the fortifications of a medieval citadel. "*This careful attention to the creation of a modern type of luxurious urbanism is one of the great successes of the Barbican*"[36].

overlay of circulation networks

The accomplishment of the Barbican's dual character – urbanely central and yet buried from the buzz of the city – is mostly attributed to the segregation of pedestrian and automobile circulation. Car traffic is kept hidden or outside the perimeter of the estate, interacting only with the roads at the entrances to the underground parking which is in turn connected by lifts and staircases to the residential blocks and to the facilities. Segregation of the circulation spaces is not only physical but also visual as once one enters the complex, the traffic is instantly out of sight.

However, the complexity of the overlaid circulation systems at the Barbican is far more complex than that. Spited into multiple levels, it instantly recalls Leonardo Da Vinci's sketches of the Ideal City (1488), with its superimposed and segregated flow, on lower floors and its upper floors, in which only pedestrians would be allowed to circulate[37] [image].

Due to the amount of possible superimposed fluxes, it would be fair to say that the circulation between uses at the Barbican is more challenging than moving between zones in a normal city fabric. The circulation and access to each different program are made in different levels, the circulation networks are intricate and superposed, and there's a lack of exceptions and architectural variations to serve as guiding visual references[38]. To help us understand the complexity of fluxes, we'll list below

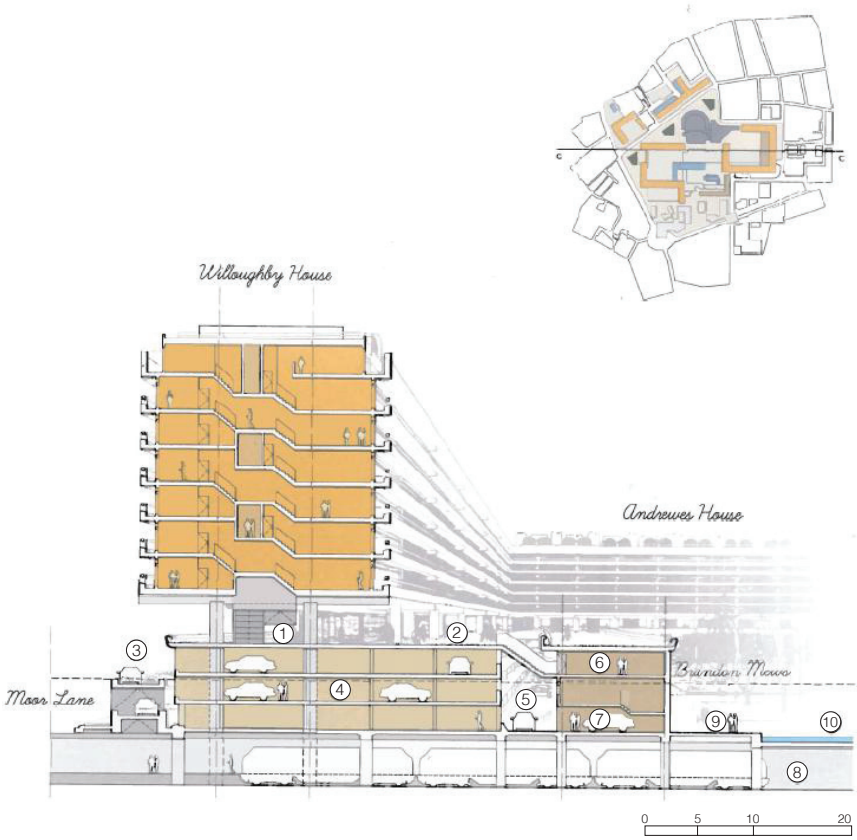
34 David Heathcote, op. cit., p. 182

35 Aurora Fernandez Per, Javier Mosas, Javier Arpa, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, a+t research group, 2013, p. 232

36 David Heathcote, *Barbican, Penthouse over the City*, *op. cit.,* p. 108.

37 Leonardo Da Vinci, *Paris Manuscript B*, 1488-90, fol. 16r.

38 Read for instance, this article about the experience of a girl who got lost while searching for the theatre at the Barbican Estate: "*Recently my daughter was in London, so I asked her to go to an architectural landmark and take a selfie. As it happened she went to a play at the brutalist Barbican. She forgot to take the selfie, instead she called to complain that she was lost in the huge building while searching for the theatre. She walked up one flight of stairs and down another and wandered*



01 LIFT AND STAIR CONNECTING FLATS, PODIUM AND GARAGES
02 PODIUM
03 VEHICLE ACCESS
04 PARKING SPACE
05 MEWS
06 TERRACE HOUSES
07 LOCK UP GARAGES
08 UNDERGROUND LINES
09 PRIVATE GARDENS
10 LAKE

The plan designed by CP&B for Willoughby House can be seen in this section with the penthouses and three levels dwellings, the interior corridors, the mews separating them from Brandon Mews and the open space for Speed Garden. Underneath this programme we can distinguish the parking facilities and the underground lines which run East to West in the direction of the lake. There is a staggered section in the volume going down towards the west and one can understand how the highwalks which run through the whole estate actually work. The elevated pedestrian street becomes the real reference level and provides access to the vertical circulation cores of the blocks and to the row houses from the stair bridges which overhang the mews.

Source: full description extracted from *10 Stories of collective housing,* a+t research group, 2013.

the overlaid levels of public and vehicle circulation that can be identified at the Barbican:

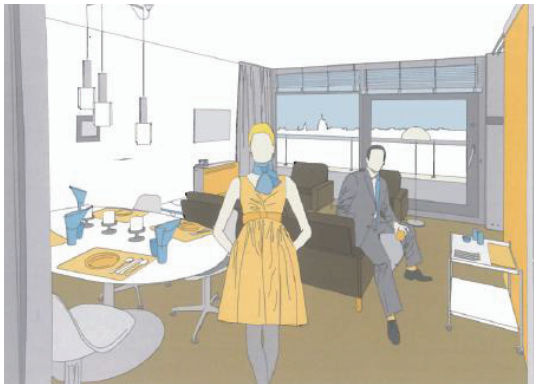
1. The street level – where cars and pedestrians access the complex – the same level as the one of the lower landscape within the Barbican 'citadel';
2. The podium, in the perimeter of the building, not only hosts parking and retail, but it also functions as a base and connecting point for the housing buildings; moreover, it acts as fortress between the inside and outside world;
3. An elevated pedestrian street (+6 to +9 m) covers the entire state, connecting different users, (spanning above Beech Street) and links the complex to the adjacent office buildings (most of the walkways are covered);
4. On top of the podium is the actual social and get-together space of the complex; the idea of covering the city roads and planning the pedestrian footpaths at higher levels enabled the stacking of uses (the complex ultimately functions at a height that is different from the one of the surrounding streets, except for the entry point from Silk Street);
5. Underground, there's even an additional circulation layer: the Barbican site is crossed from East to West by three Underground lines, the Circle, Hammersmith and Metropolitan lines, and by Beech Street, the road-underpass running beneath the podium.

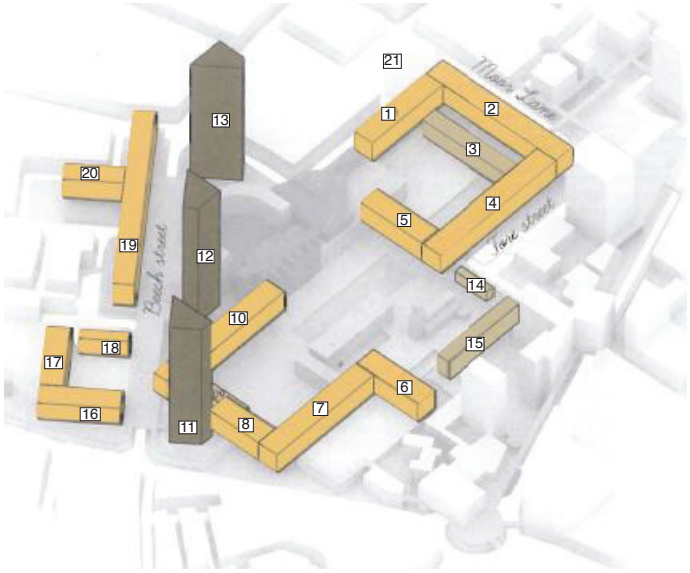
In addition to the complexity of the multiple circulation networks, the architectural solution of the complex is arranged according to diverse and contradictory principles:

1. The first has to do with direction –the mix of horizontal residential blocks with vertical towers
2. The second one has to do with the typological scheme; the different housing buildings combine high-rise cores and interior walkways, communal stairways providing access to two apartments on each floor or even terraced houses accessed straight from the ground.
3. Some blocks are semi-open, in the sense that they align with the street in some points and articulate with the network of inner elevated pedestrian paths in other;
4. The complex merges several different levels of common areas, ranging from public (yet controlled) open spaces with greenery and water features, to semi-public and private zones;
5. Finally, the project mixes programs related to education and culture in a clever linkage and articulation with housing, bearing an impact that reaches far beyond its boundaries.

A possible key point for the success of this building is indeed the power of the cultural nucleus of the complex, along with its detachment from the housing blocks that ensure the domestic privacy of the inhabitants, to whom amusement of

around but still couldn't find the theatre. In fact, she missed the play she went there to see." Source: http://iconicornot.com/getting-lost-in-the-barbican-or-creative-strolling/ (01/04/2016).





HIGH DENSITY
MEDIUM DENSITY
LOW DENSITY

HOUSING

01 SPEED HOUSE
02 WILLOUGHBY HOUSE
03 BRANDON MEWS
04 ANDREWES HOUSE
05 GILBERT HOUSE
06 MOUNTJOY HOUSE
07 THOMAS MORE HOUSE
08 SEDDON HOUSE
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13 CROMWELL TOWER
14 THE POSTERN
15 WALLSIDE
16 JOHN TRUNDLE COURT
17 BUNYAN COURT
18 BRYER COURT
19 BEN JONSON HOUSE
20 BRETON HOUSE
21 MILTON COURT (DEMOLISHED)

Source: *10 Stories of collective housing,* a+t research group, 2013.

living in an urban context with cultural activity and animation all day long might be a thrill[39]. It is possibly this cleverness in the management of opposed values like publicity and intimacy, animation and calm[40] that represents the key asset of this building.

At the same time, one should not underestimate the importance of urban density in the area surrounding the complex. Although the built complex bears an independence from its urban context – claiming to create a new 'urban environment' on its own - it depends closely on the city[41] and on the simultaneous flux of inhabitants and external users. It sets apart from the city while still punctuating the city – yet its character of a *cluster*, a reference within the city, shall not be overlooked.

housing and typological variety

At the Barbican, there are 18 residential blocks and three towers – each of them named after a historical British individual. The housing buildings consist of seven floors block above a pedestrian podium and underground cellars and parking connected to the apartment levels. The three residential towers are respectively 44, 44 and 43 floors.

The clientele for the Barbican at this time can be judged from the proposed sizes of the flats. The vast majority were to be one-, two- or three-bedroom flats; the two and three-bed being maisonettes, had enough space for the "*dramatic internal architectural features that were a defining element of their 'good class' status.*"[42] The one and two bedroom flats were possibly reserved to young people or small families. "*This too is reflected in the very adult leisure features of the flats; the lack of distinct rooms, the stage-like kitchens and the open double-height spaces*"[43].

By analysing the multiple different housing typologies that the architects Chamberlin, Powell & Bon have conceived for the Barbican, one can state that a thorough effort has been made in the sense of providing both liveable conditions (in terms of spatial quality, finishes) and sunlight to the ensemble of the dwellings - conciliating functional mix, separation/articulation of fluxes and high-rise living, while still managing to provide typological diversity, including even the traditional

39 Aurora Fernandez Per, Javier Mosas, Javier Arp a, *10 stories of collective housing – graphical analysis of inspiring masterpieces*, *op. cit.,* p. 244 : « *Intensity mainly originates from the functioning of the Barbican Centre, a cultural centre which spreads itself out over different buildings, interconnected by pedestrian platforms, lobbies and access points. Here we find concentrated the Concert Hall, the Theatre, the Guildhall School of Music, the Library, the Art Gallery and the Conservatory which was shaped around the theatre stage tower to minimize the impact of the built environment, in particular given its proximity to the Gilbert House dwellings* ».

40 See Elain Harwood, *Chamberlin Powell & Bon*, Ed. RIBA Publishing, London, 2011.

41 Anne Portnoï, « Le Barbican Center. Habiter la City » *AMC* n°227, Le Moniteur (Ed.), Paris, October 2013.

42 David Heathcote, *Barbican, Penthouse over the City*, *op. cit.,* p. 106.

43 *Ibidem,* p. 106.

row housing typology (with cars reaching the home door)[44].

The largest apartments are located at the south Side of the complex and the ones with smaller dimensions are on the North side (one- or two-bedroom apartments) – "*they could be let to poorer young people at lower rents reflecting their size and remoteness*"[45], and the different typologies within vary according to the orientation of the blocks. The towers were made up of two three-bedroom and one four-bedroom flat per floor over 37 storeys. In the terraced blocks of the South Barbican, the lower floors were made up of two-bedroom flats while the upper floors featured three-bedroom maisonettes with one of the rooms on the roof. Four-bedroom maisonettes were planned for the areas below the podium.

Amongst the different housing types planned within the Barbican, we have identified five fundamental variants:

1. The Scissor (or 'up-and-over' / 'down-and-under') apartment layout

In the East side of the site, facing Moor Lane, is the Willoughby House (02). The Willoughby House includes penthouse maisonettes at the higher levels and 6 storeys of apartments (148 on total). The base housing typology of the block may recall the scissor apartments of Le Corbusier's *Unité d'Habitation* - as the distribution is made from central corridors located at different levels – with the addition of an intermediary floor level. Each 2-bedroom dwelling is built on three semi-levels with a front-to-back layout - a way of maximizing views for the day rooms, whereas the kitchens and bathrooms are located in the middle, in the non-lit zones. The principle is set by the intention of making living rooms face west and overlook the communal gardens, whereas bedrooms face the street. In this housing block there are three components – a central body with six housing floors, penthouses at the top and parking beneath the podium - and three circulation cores - one in the centre and two in the edges. The Willoughby Highwalk is the place where the main entries are located, and parking occupies levels 01, 02 and 03.

2. Blocks with front-to-back units

The front-to-back apartment typologies are the most dominant in the ensemble – present in Speed House (01)[46], Andrewes House (04)[47], Thomas More House (07)[48]

44 Despite the interest of the Barbican's housing scheme in terms of its typological diversity and spatial quality, we must highlight that the arrangement of the different housing blocks is close to the one of the urban design of a city block than to the idea of conceiving multiple housing types within the unitary and compact volume of a Big Building.

45 David Heathcote, *Barbican, Penthouse over the City*, *op. cit.,* p. 132.

46 Speed House has 114 flats, *maisonettes* and penthouses with accommodation varying from two to five rooms. There are five floors of flats starting one level above the podium, with penthouse flats on the top floor. In addition, there are *maisonette* flats below podium level.

47 The block contains 192 flats of 13 different types, varying from 2-room to 4-room flats. The regular flats and penthouse flats above podium level follow virtually the same layout as in the other three similar blocks: Defoe, Thomas More and Speed Houses.

48 It contains 155 flats ranging in size from 1 to 4 rooms. Above podium level there are 6

and Defoe House (10)[49]. These typologies are also the most straightforward: front-to-back in the full width of the building (18.50 m), with the living area on the side that is best lit and with long balconies on both façades. On the podium level, eight glazed entrances provide access to two dwellings per floor. In six the story block of Speed House (01) there are garden flats beneath the pedestrian podium.

3. Blocks with double loaded corridor

These are the smaller units of the complex, with one bedroom and a small extra-room, and quite dominant in the complex – Gilbert House (05)[50] – over the lake -, Mountjoy House (06)[51] and Seddon House (08)[52]. Most of the north-south blocks have a central corridor on each floor. In this case there are two dwellings, one to the northwest and other to the southeast on both sides of a central corridor running through the building, and both have long balconies. The vertical lifts and stair shafts are located at the ends and the podium is interrupted (there are no row houses on the lower levels).

4. Row houses /garden-flats

The two-level garden-flats are located underneath the podium of Speed House (01), Thomas More House (07) and Defoe House (10), at lake or garden level. These northeast-southwest facing blocks have dwellings with private gardens looking onto the interiors of the block. The sizes of the units are larger and look more like an urban block. The access to these units is made by going down from the public podium. Most of the dwellings are slightly elevated from the level of the lake, except for the middle houses where a spiral stair connects the two floors. Car parking is provided at the rear of the dwellings in the Mews between this block and Willowghby House (02).

5. The towers / High-rise housing

In between the north and south sides of the Barbican, aligned with Beech street, there are three tower blocks with a polygonal floor plan and with similar layouts. Cromwell Tower (13)[53], located further north, is 43 storeys high above the podium.

storeys of flats and 1 of penthouse flats.

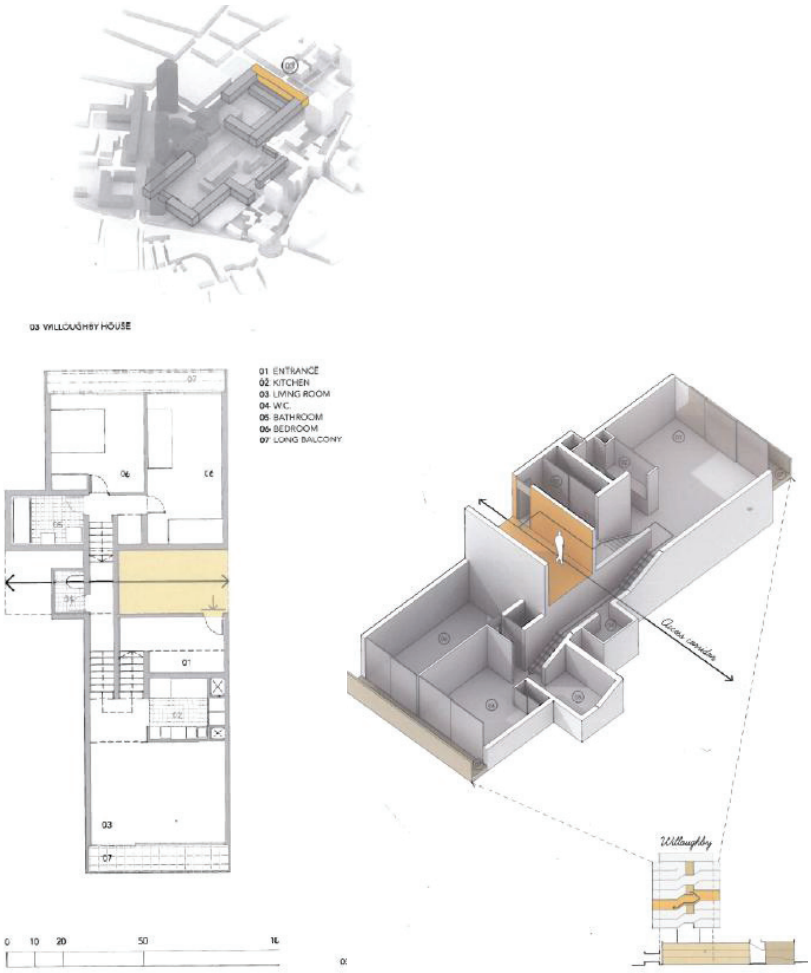
49 *In Defoe House there are 178 flats and maisonettes of which 24 are roof-top penthouses.* Source: http://www.barbicanliving.co.uk/

50 *Gilbert House contains 88 flats and penthouses ranging in size from one to five rooms. There are 5 storeys of flats and 2 of penthouses, above the podium level.* Source: http://www.barbicanliving.co.uk/

51 *Mountjoy House contains 64 flats and penthouses ranging in size from 2 to 5 rooms. The flats are mainly identical to the flats in Gilbert House. There are 5 storeys of flats with penthouse maisonettes above.* Source: http://www.barbicanliving.co.uk/

52 *There are 6 storeys of flats above podium level with penthouse maisonettes above that. Seddon House has 75 flats and maisonettes, ranging from one-room studio flats to five-room penthouse maisonettes.* Source: http://www.barbicanliving.co.uk/

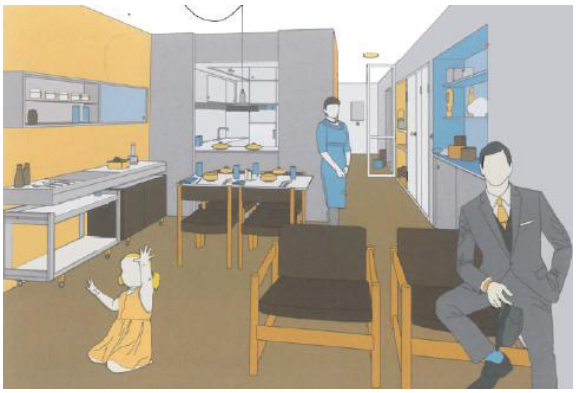
53 *Cromwell Tower contains 108 flats and 3 penthouse maisonettes of similar design and layout*

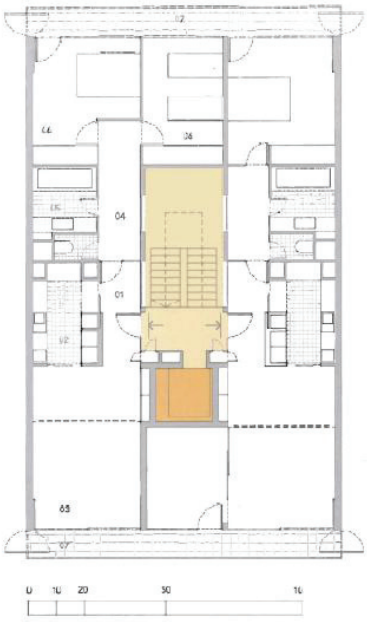


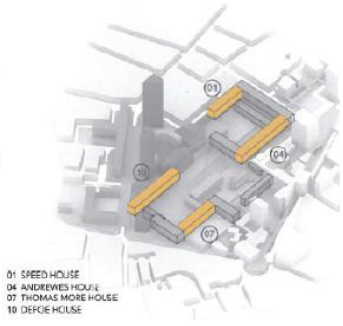
WILLOUGHBY HOUSE
down-and-under block - typical unit

Located at the eastern end of the site, the layout has three main components: a central body with six residential storeys, penthouses at the top and car parking beneath the podium.
A special attention has been given to the central body, and its design strategy has been called: Scissors or Down and Under (Up and Over in some cases). This means that you enter the dwelling from the interior corridor and then go down half a storey to the living room and go down again two sections more to go, in the first case, under the interior corridor to get to the bedrooms. In other cases the floor plan is the same but going up all the time. The aim is to make the living rooms face West, overlooking the communal garden towards Speed Garden, and the bedrooms look onto the street. For this reason, the dwellings are fron to back, going from one orientation to another. The toilet and the bathroom are interior on the floor plan with no natural light. In order to avoid having too many circulation cores, the corridors are located on intermediate levels in relation to the dwellings. In this block there are three vertical circulation cores, one at the centre and two at each end.

Source: Full description extracted from *10 Stories of collective housing,* a+t research group, 2013.



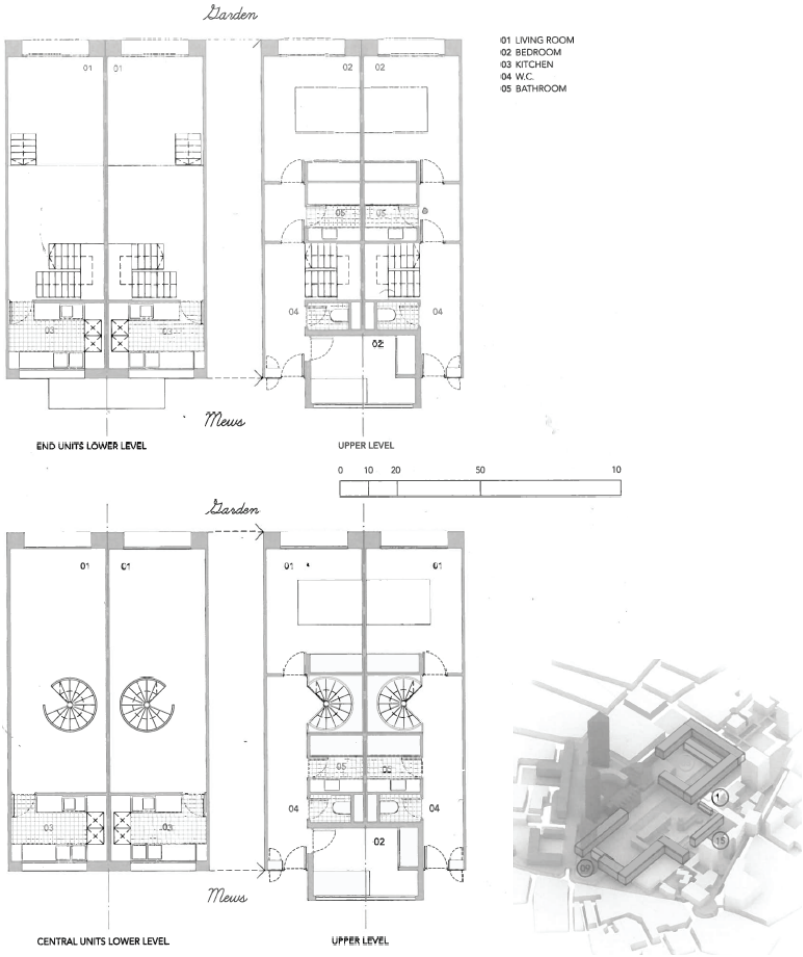




SPEED HOUSE, ANDREWES HOUSE, THOMAS MORE HOUSE, DEFOE HOUSE
front-to-back block - typical unitS

In the front-to-back blocks, the main purpose is for the living areas to receive sunlight for most of the day. In this case a front-to-back housing solution was adopted with long balconies on both façades.
Speed house (01) is six storeys high with garden-flats beneath the pedestrian podium which runs around the whole building. On the podium level there are eight glazed entrances providing access to two dwellings per storey.

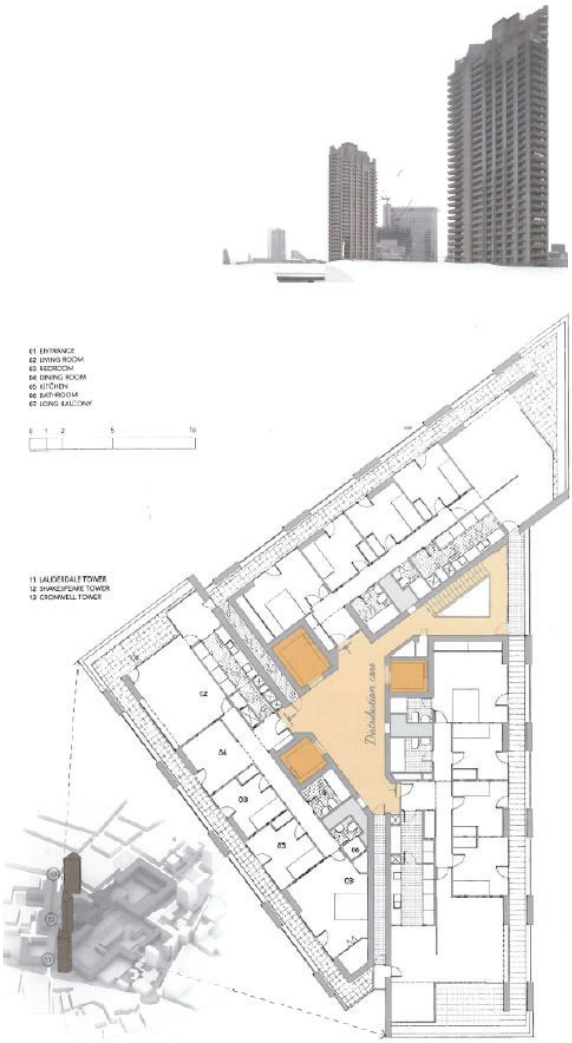
Source: Full description extracted from *10 Stories of collective housing,* a+t research group, 2013.



BRANDON MEWS, LAMBERT JONES MEWS, THE POSTERN, WALLSIDE
GEORGIAN STYLE GARDEN FLATS - typical units

The layout is a line of twenty-six two-storey row houses. Access is done by going down from the public podium, under the Willoughby House (02) block. The interior solution adopted for the end dwellings is a split level living area and a straight two-flight staircase. Most of the groundfloor is saised in relation to the level of the lake. The twelve dwellings located in the middle do not have this height difference and there's a spiral staircase connecting the two floors. There is car parking at the rea of the dwellings in the Mews between this block and Willoughby House (02).

Source: Full description extracted from *10 Stories of collective housing,* a+t research group, 2013.

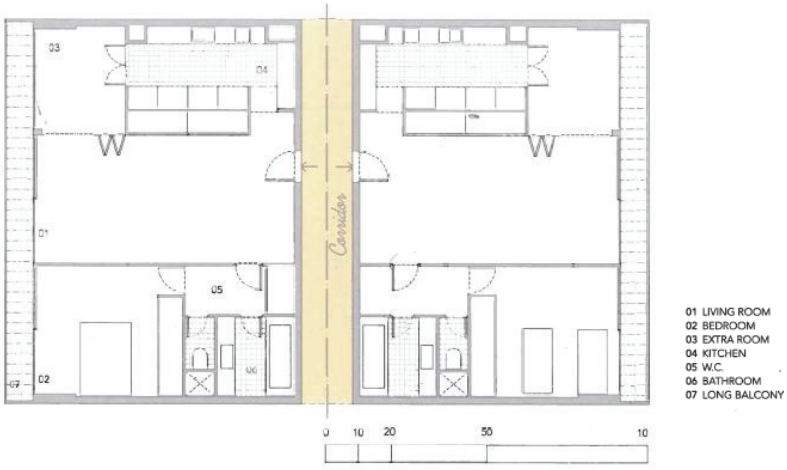


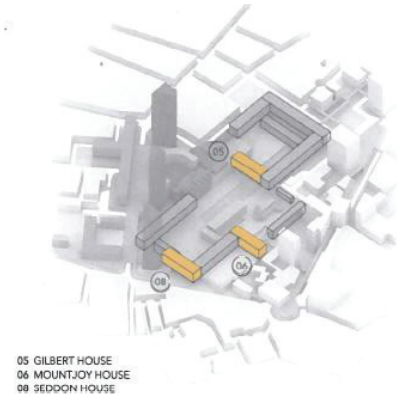
LAUDERALE TOWER, SHAKESPEARE TOWER, CROMWELL TOWER
TOWER - typical units

The three towers have similar layouts, varying only in the use of the final rooms (in some cases bedrooms, in other cases living rooms). Orientation varies from one tower to another so that all rooms receive sunlight at one point of the day. Access to each tower is produced in a different way. The service areas of the apartments are always interior (no natural light), On the other hand, all bedrooms and living areas have acess to a gallery/terrace.

Aceess to the Cromwell tower (13) is from the north podium and from Beech Street or Chiswell Street level. The Shakespear tower (12) is accessible from the north and south podiums, each at a different level. Lauderale (west) is connected by the south podium. Each tower has a central triangle-shaped lobby with three lifts.

Source: Full description extracted from *10 Stories of collective housing,* a+t research group, 2013.





GILBERT HOUSE, MOUNTJOY HOUSE, SEDDON HOUSE
DOUBLE LOADED CORRIDOR - typical units

The blocks have a dwelling on either side of the corridor. The vertical lift and stair shafts are located at the ends. Most dwellings are laid out with three bays and an exterior long gallery. Gilbert House (05) stands on twelve large double cilinder section columns which are supported over the lake, with a continuous view over the water features. The penthouses on top are for larger apartments of up to five bedrooms over two floors.

Source: Full description extracted from *10 Stories of collective housing,* a+t research group, 2013.

The other two, Shakespeare Tower (12)[54] and Lauderdale Tower (11)[55] are 44 storeys high. The floor plan for each tower comprises three dwellings, each with a different orientation.

The access to each tower block is done differently: Cromwell Tower is accessed from the the north podium and Beech Street, Shakespear from the north and South Podiums (at different levels) and Lauderale connected by the South podium. Each tower connects to an underground level of parking.

All the apartments have at least a balcony, accessible through a large sliding glass door and aluminium frame varnished wood, and the general interior finishing are thought-through and executed with high quality materials that remained in good condition over years.[56]

parking

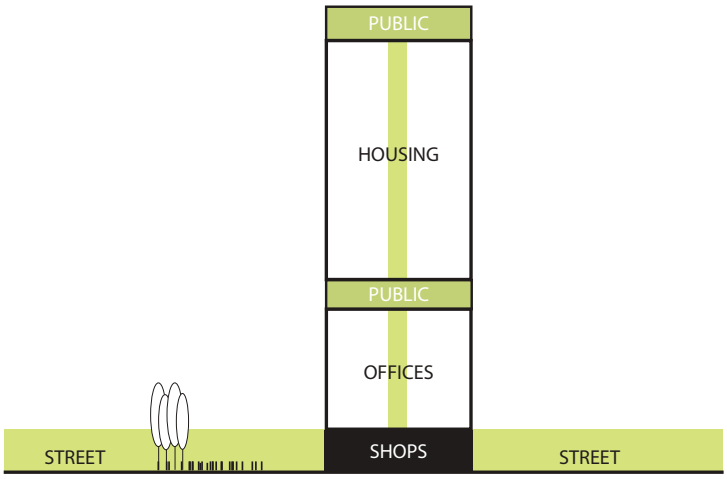
The original idea for the project was to have one parking space per dwelling in the area, and today there are over 2'000 parking spaces on the whole estate with road access from the perimeter streets. The parking zones act as a buffer between the inside of the block and the city. At the same time, they allow the comfort of arriving the complex by car and reaching home within covered space.

to the flats and penthouses in Lauderdale Tower. Source: http://www.barbicanliving.co.uk/

54 Shakespeare Tower contains 113 flats and 3 penthouse maisonettes.

55 Lauderdale Tower contains 114 flats and 3 penthouse maisonettes of similar design and layout to the flats and penthouses in Cromwell Tower.

56 The detailed description of each housing block, in terms of orientation, housing typologies, access, parking, etc, have been found online at: http://www.barbicanliving.co.uk/maps-of-the-estate/ (01/04/2016).



Source: Author Diagram

2.2.5. The Vertical Stacking of Functions
The *American Hybrid*

> *"The distinctive nature of space in mixed-use buildings demands a reevaluation of the methodology employed in single-use projects, giving rise to debate over what was the best form for accommodating diverse and superimposed functions in one structure."*[1]

We have seen above that the concept of functional hybridity isn't a new subject. Indeed, "*throughout history, density, the value of land and the overlapping of functions have been inherently linked*"[2], compelling functions to mix. Yet, although back in time disparate functions have recurrently been merged within basic mixed structures as the shop-house building, the inhabited bridge (such as the Ponte Vecchio), or other mixed housing models[3], the *hybrid building*, at its large scale and defined outlines, did not appear until the end of the nineteenth century[4].

the vertical stacking and the zoning regulations

A series of dense mixed organisms emerged then, all along the twentieth century, based on the logic of the vertical stacking of functions. In the specific case of Manhattan, increasing urban density and land values have forced the vertical overlapping of functions. The functional mix has become synonym of a gradually intensified diversity of program and the built envelopes became increasingly larger[5]. Functions started then to interact with one another, sharing intensities[6], and the façades stopped revealing the different functions contained within, triggering the classification of these mixed-use buildings as *Hybrids*. This classification has been formalized in Joseph Fenton's *catalogue,* published in 1985[7], categorizing a series

1 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice*, MIT Press, Cambridge, 2003, p.240.

2 Aurora Fernández Per, Javier Mozas, *Hybrids I; High rise mixed use buildings*, a+t, Vitoria-Gasteiz, 2008, p. 5.

3 To illustrate early forms of functional hybridity in housing, Joseph Fenton uses as example a Group of Low-cost housing projects for Paris, at 13 Rue des Animaux, designed by Henry Sauvage in 1992, in "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, Princeton Architectural Press, New York, 1985, p. 6.

4 Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, *op. cit.*, p. 5.

5 The history of the vertical stacking of functions and the hybrid buildings begins in New York by the end of the 19th century, when the dense city started to accept the overlapping of functions as inevitable. It is inside the metropolises where these mixed organisms arise, helped mainly by centrality's power as a catalyst.

6 Aurora Fernández Per, Javier Mozas, *Hybrids I*, op. cit., p. 7.

7 Joseph Fenton argued that there was *a clear difference between the hybrid building and mixed-use, in the way that the individual programs relate to one another and begin to share intensities.* Moreover, Fenton organizes hybrid buildings within *three categories: Fabric Hybrids – volumetric infill of the city's gridded fabric; Graft Hybrids – each program is expressed, resulting on a hybrid form; Monolith Hybrids – programmatic elements being subsumed into a continuous envelope*. See Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, *op. cit.*, p. 7.

A. Industry
B. General Market
C. Offices
D. Theatres
E. Residences
F. Stores
G. Hotel
H. Amusement park

100-STORY 'SCRAPER' NEXT

NEW YORK BUILDER PREDICTS MUCH TALLER STRUCTURES.

Will Be Constructed of Reinforced Concrete and Cover a Block or More —Elevator Service Will Be Revolutionized and People May Be Shot Upward in Pneumatic Tube Conveyances with Rapidity Letters Are Sent Across Brooklyn Bridge.

New York, May 13.—[Special.]—A 100 story building, covering an entire block, will probably be the next development of this age of skyscrapers, according to Theodore Starrett of the Thompson-Starrett Building Construction company, one of the leading builders of New York. The material used in the giant structure, in Mr. Starrett's opinion, will be reinforced concrete. He considers this the building material of the future.

The conditions peculiar to Manhattan have developed the narrow, shaft like "skyscraper" to the highest point. These same conditions will create the first giant structure of fifty stories or more. Progressive builders operating on a large scale in New York know it is coming, but are not quite ready to accept the new order of things, as builders in New York and Chicago were slow to accept the possibility and practicability of a twenty story steel frame building twenty-five years ago.

Taller Buildings Soon.

"Will New York have a 100 story building in the near future?" said Mr. Starrett. "Perhaps, I might say, 'not yet, but soon.' In New York we must keep on building and must build upward. Practically we have reached the limit of altitude for the present type of buildings. Now we must develop something different—something larger.

"We have about reached the limit so far as elevator service in our high buildings is concerned. The weight of the cable for a twenty-eight story building elevator service is something enormous and if we are to build much higher we must find some new method of perpendicular transportation. We are taxing our brains with the problem of horizontal rapid transit, but the problem of vertical rapid transit must soon be one of equal importance. In New York we travel heavenward as well as on the surface.

Faster Elevators Predicted.

"No doubt instead of the old style elevator the new type of building will be equipped with pneumatic tube conveyances, and we shall be shot upward with as great rapidity as letters are sent across Brooklyn bridge. Perhaps we shall have transfer points at each twentieth floor and on each transfer floor there will be some particular department. Maybe on the twentieth floor we shall have a general market, on the fortieth floor theaters, on the sixtieth a shopping district, and so on, for the big building of the future will be a city within itself."

The One Hundred Story Building - New York, 1906, Theodore Starret

Source: Joseph Fenton, «Hybrid Buildings», Pamphlet Architecture n. 11, New York San Francisco, 1985.

Original Article Published in Chicago Tribune, May 14, 1906

http://archives.chicagotribune.com/1906/05/14/page/3/article/100-story-scraper-next

of American mixed-use buildings as 'hybrids' due to their increased levels of urban complexity that set them apart from other mixed-use buildings: *"these buildings retain the underlying city and are contained within a single form or building"*[8].

One of the seminal projects of functional hybridity – and possibly the clearest one at illustrating the *hybrid building's* fundamental principles - is a non-built project called 'One hundred story building', planned by Theodore Starrett in 1906, highlighted in Joseph Fenton's catalogue of hybrids[9]. It is interesting to read the project description and the motivations at its base: "*a single structure on a single urban block could become the life nucleus and sole support of the people within*"[10]. A seminal form of "city within a city" was latent in this project, as a strategy for reducing urban congestion and improving human life by diminishing the need for people to commute between different points of the city[11]. Indeed, the project held most of the functions one could expect to find in a city: Industry, General Market, Offices, Theatres, Residences, Stores, Hotel and Amusement Park, distributed by the following order:"*industry at the bottom, business in the next section, residences above and a hotel above that, with each section separated by public plazas including theatres, shopping districts, and, at the top, an amusement park, roof garden and swimming pool*"[12].
The fact that industry[13] is placed at the ground level represents a radical change from the usual logics of mixed-use buildings, as industry is normally hidden from the city life[14].

This "city within a city" principle has been further proclaimed later, in the 1930s, by Raymond Hood – *"Every businessman in the city must have realized what an advantage it would be to live in the building where his office is located. It is toward*

8 Aurora Fernández Per, Javier Mozas, *Hybrids I*, op. cit., p. 9.

9 Joseph Fenton, « Hybrid Buildings », *Pamphlet Architecture nº 11*, *op cit*. This Building has also been published in Rem Koolhaas's *Delirious New York*, *op. cit*, p. 90.

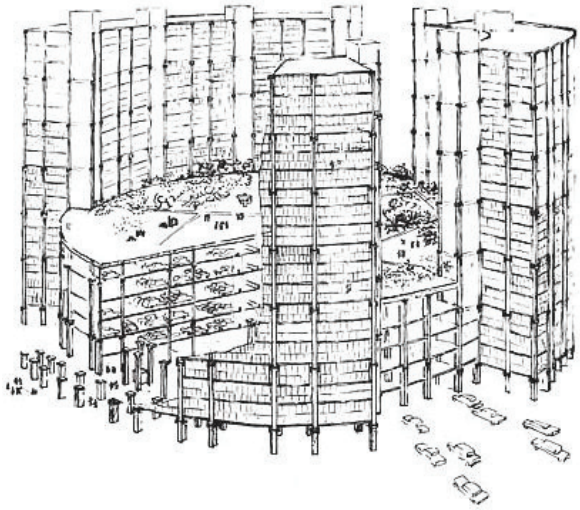
10 Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, *op. cit.*, p. 33.

11 This project has also detained the attention of Rem Koolhaas, who quotes Starrett in Delirious NY: *"In New York we must keep building and we must build upwards"* –to enhance the generic potential of the skyscraper and its almost endless number and combination of programs coexisting on separate floors. See Rem Koolhaas, *Delirious New York*, Tames and Hudson, London, 1978, p. 90.

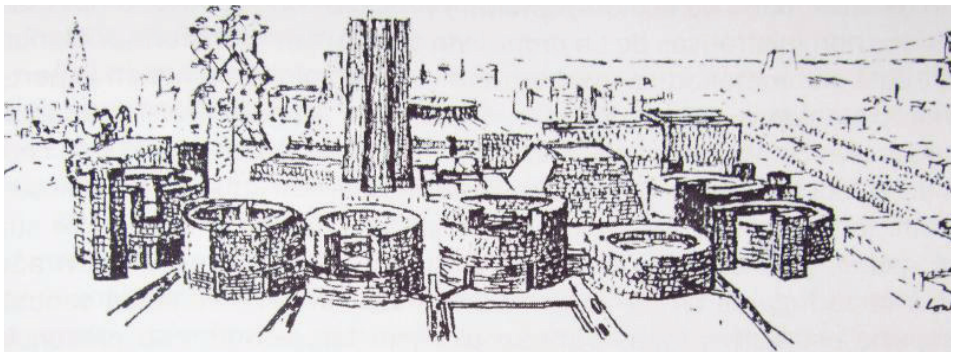
12 Paul Goldberg, *The Skyscraper*, Alfred A. Knopf, New York, 1982, p. 10 (a drawing of Starrett's proposed 100-story building as it appeared in the New York Herald, May 13, 1906).

13 Nina Rappaport has led several research projects that test the relation between industry and city: See "Post Industry", *an essay for catalogue of exhibition INDUSTRY! Project 0047 and Norsk Form at the Norweigan Centre for Design and Architecture, curated by Maarten Braathen and including architects Barkow Leibinger, drMM, Helen & Hard, August 10-September 24, 2006.*

14 The intention of detaching the building from the surrounding urban space is possibly announced by means of the location of industry – at ground level - and the stores – at a higher level of the building. Industry is the program that normally turns its back to the city and the urban life; yet, in this project, it is the program located at street level. On the other hand, we have seen before that commercial activities located at the base of the building increase urban life at the street level and put building and street into a close relation. But if the container has no relation with the city at this level, it is possibly proclaiming itself as a "contained city", and the base, the entry door, becomes the threshold between the city fabric and the new "city within a city".



Louis Kahn. Civic Center, project, Philadelphia, Pennsylvania.
The 'docks' - Cylindrical Parking and Apartment Building.



Louis Kahn. Civic Center, project, Philadelphia, Pennsylvania. aerial perspective. c. 1957.

this ideal that real estate firms and architects should work"[15]. Aside with Starrett, Hood defended the construction of multi-functional buildings, *cities under a single roof*, combining all the different uses of the city within a massive volume[16].

Despite the fact that the vertical stacking of functions seemed to represent a natural way to go since the beginning of the twentieth century, the appliance of the New York Zoning Resolution in 1916[17] has been effective at limiting the mix of functionally incompatible uses, designating areas for residential districts and other areas for office/commercial districts[18]. "*Increasing density, greater building height and mixed-use zoning in the central city fired the public imagination for the multi-layered, multi-use vertical city long before it became common in actual skyscrapers*"[19]. This may explain why there is almost no housing (only hotels) within the hybrid buildings compiled in this catalogue (aside with the acknowledgement of housing as being the most challenging program to articulate with other functions)[20]. This explains, possibly, why the program mix contained within most of the *American Hybrids* until the late 1960s is rather linked to leisure activities. Indeed, most of the examples in the catalogue published by Joseph Fenton contain public services and activities (theatres, auditorium, church), functioning in a close relation with the city fabric and contributing to the 'city-like' liveliness of the adjacent streets.

The specificities of these mixed developments had also been explored in early theoretical projects like Louis Kahn's masterplan for Philadelphia's city centre (1952-1954). This utopian project explored multiple themes, most of them identified also in the Team Ten's conceptual explorations: the articulation of different circulation networks and traffic patterns, the relationship between the existing urban fabric and that of the proposal, and how to combine functions and typologies – ideas we have also seen implicit in Jane Jacobs's *The Death and Life of Great American Cities*[21].

15 Rem Koolhaas, *Delirious New York*, *op. cit.,* p. 90.

16 However, as we will see later, Raymond Hood understood the limitations of the tower (possibly for leaving behind the urban elements of city – the street, the square), and worked on the reintroduction of models that explored the wider potentials of the horizontal bounds. We are referring to the project of the Rockefeller Center, planned by Raymond Hood in 1930-39.

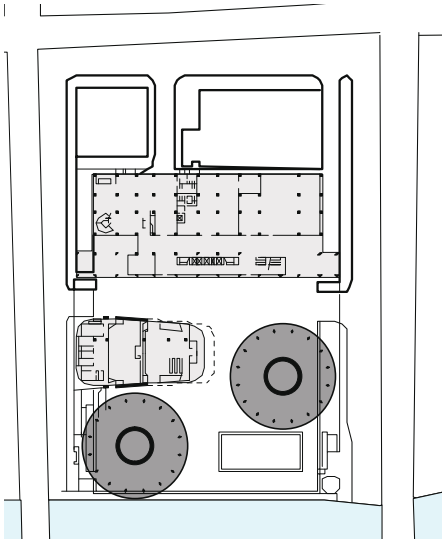
17 Aurora Fernández Per, Javier Mozas, *Hybrids I*, *op. cit.,* p. 5.

18 This fact is explained in Fenton's catalogue as a consequence of the zoning laws of 1916, but it is naturally also influenced by the Charte d'Athènes, whose image is published in the catalogue right next to Theodore Starrett's project.

19 Scott Johnson, *Tall Building: Imagining the Skyscraper,* Balcony Press, Glendale Calif., 2008, p. 59.

20 The truth is that the schemes of hybrid buildings that have followed this paradigm and that have actually been built differ, in many points, from the base intentions of the *One Hundred Story Building*'s fundamental principles. On the one hand, they seem to keep a strong bound with the city fabric (theatres, stores and parking are the most common uses in direct contact with the ground and many users end up only experiencing the building at its base level). On the other hand, only very few of these buildings actually contain housing, which may pronounce the difficulty of blending the most intimate of all programs with public services and labour within the same structure.

21 Nathaniel Popkin, "In This Month Of Jane Jacobs, A Look At The "Philadelphia School" That Inspired & Frustrated Her", *Hidden City Philadelphia*, May 2016. Source: http://hiddencityphila.



Marina City, Bertrand Goldberg, Chicago, 1964
Source: base plans by Hilary French, 2008.

"*These streets now, these expressways, are really rivers; they need harbors. And our smallest streets are canals; they need docks*."[22] The project climaxed in the typological invention of colossal "docks" or gateways to the center: "*The "Docks" concept, an enormous cylindrical body as anchoring point on the edge of the city centre, includes a multi-storey parking garage for approximately 1500 cars, with residential and business zones arranged in rings above. These buildings were intended as "entrance towers" to the city, taking on "protective functions" in their "meaningful form". As an image, the medieval town wall is transposed on to a new urban dimension.*"[23] Kahn's project provided an important basis for the conception of the mixed-use skyscraper as a complex event – "*a product of aggregation that was closely associated with the urban topography*" [24].

The Marina City Complex (1964), Bertrand Goldberg

As a consequence of the pressures triggered by the increasing land cost, the unfruitful outcomes of urban segregation and the technological evolutions, the law supporting the functional zoning has been amended in 1960[25], promoting henceforth the mix of functions as way of invigorating the city, and eventually allowing the construction of mixed-use schemes containing housing.

One particular building has possibly been at the origin of this change: the Marina City building, in Chicago (1964), designed by the architect Bertrand Goldberg. The complex is said to have "*forged the way for a return to downtown living by first addressing Chicago's zoning in order to permit mixed-use development on one site.*"[26]

the first American 'hybrid building'[27] containing housing

The Marina City complex has indeed been the "*the first mixed-use downtown development to include housing*"[28] and also the first high-rise post-war residential project built in Chicago in the early 1960s. Time has then validated Reyner

org/2016/05/in-this-month-of-jane-jacobs-a-look-at-the-philadelphia-school-that-inspired-frustrated-her/ (20/05/2016).

22 See Louis Kahn, *Louis Kahn : essential texts / [edited] by Robert Twombly*, London : W. W. Norton, New York, 2003.

23 Klaus-Peter Gast, *Louis I. Kahn*, Birkhauser, Basel, 1999, pp. 44-45.

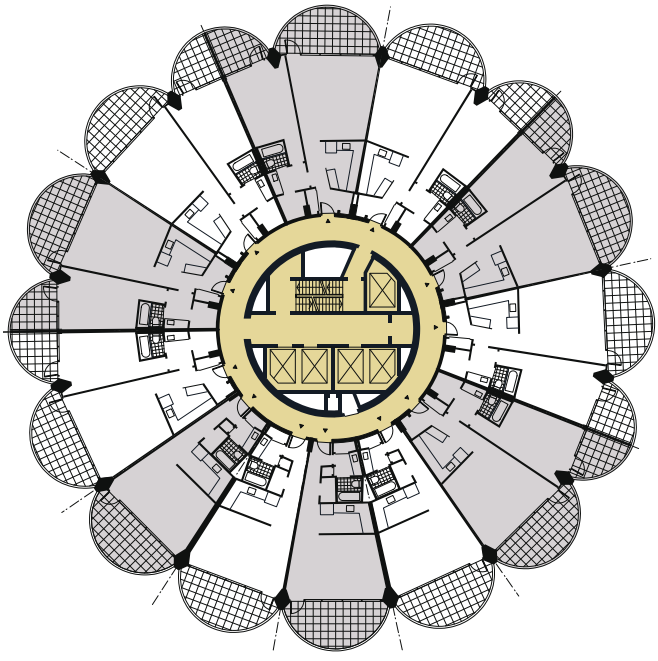
24 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice*, p.234.

25 *« By 1960, the city's zoning ordinances were being rewritten not only to allow for these new aberrations but to provide density bonuses up to twenty percent for projects composed of tall slender towers and large open plazas (…) »*, Scott Johnson, *Tall Building: Imagining the Skyscraper, op. cit.* p. 23.

26 Sarah Whiting, "Speculating beyond iconicity", *in* Zoë Ryan, *Bertrand Goldberg - Architecture of Invention*, Yale University Press, New Haven and London, 2011, p. 159.

27 Curiously, the Marina City building is not published in Joseph Fenton's catalogue of hybrids, although it seems to fit the features of this category, as they are described by the author.

28 Sarah Whiting, "Speculating beyond iconicity", *op. cit.,* p. 145.



Marina City, Bertrand Goldberg, Chicago, 1964
Source: base plans by Hilary French, 2008.

Banham's predictions at the occasion of the completion of this project - which he considered "*so heroic in conception*"[29]; it would be expected not only to mark a historic moment in Chicago's architectural heritage but also to have a high influence in mid-century's urbanism in general. This mixed-use building is particularly noticeable for its peculiar shape – mostly the two prominent circular towers - and for the innovative housing scheme it contains. As noted by Igor Marjanovic and Katerina Ruedi Ray in the monograph *Marina City: Bertrand Goldberg's urban vision (2010)*, the iconicity of the Marina City complex has had an important role in the downtown regeneration of Chicago, as much as it offered to the city a more glamorous appeal[30].

The project consists of two 65-story residential towers of 'high density living'[31] with identical floor plans, hosting a total of 896 apartments. The base of each tower up to the 19th floor contains parking, with a 896 spot capacity per building, allowing direct access to the dwellings trough a central vertical core. The in-between level (the 20th floor) houses common services like the laundry rooms. On the highest level of the building, the 61st, there's an open-air roof floor to be enjoyed by the residents. A commercial office building, in the rear of the towers, sits on top of a 2 story commercial base (that includes shopping and bowling), right next to an ice-skating ring and a theatre[32]. The ensemble sits on a slab filled with commerce and restaurants above the marina; the rooftop of this structure is a square at street level and the ensemble forms a sort of 'island'.

"*A city within the city*"[33] has been the obvious slogan used by Goldberg to describe the project[34]. He described it as "*a remedy for the problems created by zoning, which separates out residential areas from commercial districts, and as a way to plan for two 'shifts' –by stacking daytime and night-time uses on one site*"[35]. Besides the functional mix, the developer's aim was to provide rental apartments and studios for office workers, avoiding their daily commute to the surrounding suburbs. One could therefore live, work and play within Marina City's block without ever needing a car or a boat, since the "island" was self-sufficient. *"The perfect antidote to fears of*

29 Reyner Banham, « Walk in the Loop », *Chicago Magazine*, Spring 1965, pp. 24 – 28.

30 Igor Marjanovic and Katerina Ruedi Ray's, *Marina City: Bertrand Goldberg's urban vision*, Princeton Architectural Press, 2010, p. 93.

31 Marina Management Corporation, *Developer Booklet of the project Marina City – a City Within the City*, Chicago, 1980-1993, p. 5.

32 Elizabeth A. T. Smith, "Space, Structure, Society – The Architecture of Bertrand Goldberg", in Zoë Ryan, *Bertrand Goldberg - Architecture of Invention*, *op. cit.,* p. 34: "*(…) this mixed use project became an innovative and unprecedented mix of apartments, an office building, retail and other commercial facilities, and recreation, including a skating ring and a theatre*".

33 Marina Management Corporation, *Developer Booklet of the project Marina City – a City Within the City*, Chicago, 1980-1993.

34 *« (…) the glimpses of animation at Marina City promised another way of living : a world unto itself or a « city within a city », as Goldberg called it. While iconic, the towers at Marina City would never be reduced to a singular sign »*, in Sarah Whiting, "Speculating beyond iconicity", *op. cit.,* p.145.

35 Hilary French, *Key Urban Housing for the twentieth century*, King Publishing, London, 2008, p. 122.

Marina City, Façade
http://4.bp.blogspot.com/-9xrm5bapqco/ViDeMLad6pI/AAAAAAABcL8/UY18_8qako0/s1600/marinapetals.jpg

urban living, Marina city was a superblock-sized bubble of activity, productivity and calm; a vision of an other urbanism" [36].

the building and the city

The Marina City project seems to implicitly reprise the themes explored by Louis Kahn in his project for Philadelphia - mainly its colossal "docks" (or gateways) to the center - mixed use buildings serving office, housing and parking needs -, -, somehow exploring the simultaneous and articulated planning of infrastructure and housing. Indeed, as noted by Ábalos & Herreros, "*housing becomes the terminus of two transportation systems: the Chicago River, accessible from a wharf; and vehicular traffic, which concludes in a spiral traffic structure*" [37].

Marina City epitomizes a successful articulation of iconic architectural volumes with the city, by means of a well-rooted urban base. Its raised common plaza[38] - with the ensemble of five buildings inserted from below floor level - offers a seducing variety of activities to the users (including commerce, restaurants, a concert hall and a 700-boat marina linked to the river), while it simultaneously delivers a valuable public space to the city, activating its regeneration. In that sense, the importance of Marina City's animated base as an exemplary articulation element between building and city cannot be overlooked. This project has indeed succeeded in a complex challenge: defining a community while not isolating it from the surrounding city[39].

The creation of an environment where working people could "live above the store" - with easy access to leisure-time and cultural facilities as well as other urban amenities - transformed the project in a potential paradigm for future development of the downtown Chicago[40]; eventually, the success of the project motivated its reproduction in other American cities[41].

36 Sarah Whiting, "Speculating beyond iconicity", *op. cit.*,p. 145.

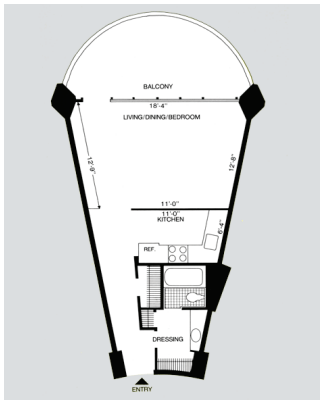
37 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice, op. cit.,* p. 234.

38 Aside with the resemblances with the examples of 'vertical urbanism' analysed above – the raised public space and the car parking being a significant part of the functional mix – it also seems to resonate with other projects of the time, like the plug-in buildings of Archigram or the Japanese Metabolists; see Sarah Whiting, "Speculating beyond iconicity", *op. cit.*, p.145.

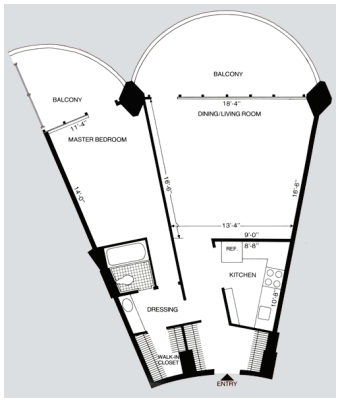
39 Sarah Whiting, "Speculating beyond iconicity", *op. cit.,* p.159.

40 Elizabeth A. T. Smith, "Space, Structure, Society – The Architecture of Bertrand Goldberg", *op. cit.,* p. 34.

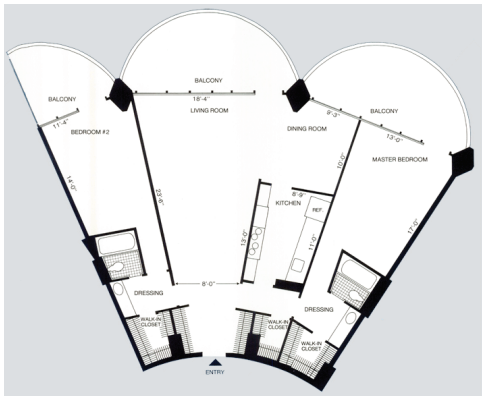
41 *« Marina city spawned several offspring during the 1960s: three different variations were designed for Detroit and similar round tower schemes were planned for Denver, Boston and Philadelphia. None of these schemes were built, but all demonstrate the breadth of the urban proposition underlying Marina City. », in* Sarah Whiting, "Speculating beyond iconicity", *op. cit.,* p. 153.



efficiency unit



one-bedroom typology



two-bedroom typology

Marina City, Bertrand Goldberg, typical plans - apartment typologies
Source: plans by Hilary French, 2008.

an iconic building with a 'humanist' character

The repeated use of the expression "*living above the store*" [42] to portray Marina City denounces the accomplishment of rare living qualities. Indeed, within this building, we have identified the 'humanism' that we seek to investigate in large scale projects: here, despite the largeness and iconicity, the building epitomizes "*a social architecture that includes all of the mixed use urban complexity that mainstream modernism had neglected or ignored*"[43].

This possibly explains why this building has prevailed, through times and until our days, an attractive living place, remaining a *"sought-after residential facility with public spaces that bustle with the critical mass of human activity and density that Goldberg believed essential to a vibrant urban environment."* [44]

architectural innovation and social engagement

Although the idea of typological/social mix hasn't been a motto for the Marina City building propaganda, a clear social engagement can be acknowledged at the base of the project. Bertrand Goldberg's interest in density was indeed aimed at improving the world socially[45]. The cleverness of his design allowed not only for an balanced spatial quality in all the apartment units, but also for a cost-efficient construction[46], which eventually enabled the apartments to be rented at low prices. Delivering small dwellings with low rents has probably been a clever way of enabling social mix without needing to refer to it. At the same time, the Marina City building opened the way for households which weren't, until then, considered as 'families' by the FHA[47], including single people, parents and childless and unmarried couples[48]. The range was open amid three typologies: a studio, a 1bedroom apartment and a 2bedroom apartment, bearing unusual layouts due to the circular plan.

The plans of the apartments are indeed peculiar due to their length and narrowness. In the 'efficiency unit', for instance, the kitchen, storage and bathrooms - located right next to the entry door, in the darker and shallower zone of the dwelling - occupy nearly half of the area (and depth) of the apartment. The living room has

42 Elizabeth A. T. Smith, "Space, Structure, Society – The Architecture of Bertrand Goldberg", *op. cit.,* p. 34.

43 *Ibidem*, p. 34.

44 *Ibidem*, p. 39.

45 About Goldberg's aim to improve the world socially and fiscally, read Heinrich Klotz in conversation with Bertrand Goldberg, in John W. Cook and Heinrich Klotz, *Conversation with Architects*, Praeger Publishers, 1983, p. 138.

46 *"A completely circular configuration of the residential towers at Marina City proved more economical in terms of construction costs and provided greater site densification on the modest building footprint." in* Elizabeth A. T. Smith, "Space, Structure, Society – The Architecture of Bertrand Goldberg", *op. cit.,* p. 34.

47 FHA stands for *Federal Housing Administration; the FHA is an arm of the Department of Housing and Urban Development (HUD).*

48 Sarah Whiting, "Speculating beyond iconicity", *op. cit.,* p. 159.

Source: http://www.loopnorth.com/image/2012/mcramp1sm.jpg

Marina City - parking / view from the river

Source: http://2.bp.blogspot.com/-O8XfLFza7ZU/TftN2Anc_vI/AAAAAAAAgz8/F9aIpliNjmU/s1600/LI-archi-MC-107b.jpg

modest dimensions - almost the same area as the balcony in front of it. The other two types are a bit more balanced in size, but the size of the balconies remains too large in comparison with the size of the apartments. In the three-bedroom typology, the living room occupies the entire depth of the apartment, in a triangular shape with a maximum of 6,4 m width close to the glass façade – it is probably an uneasy task to organize this place with furniture.

However, and despite the small dimensions of the dwellings, the design quality of the scheme and the striking functional diversity of the 'island' ensured a high occupancy rate right after completion[49]. The generous balconies and great views contributed widely for the attractiveness of the dwellings, providing a successful disguise to the reality of "high density living": *"Suspended above the noise and dirt of the rest of Chicago, residents could take in the extraordinary views and still have fresh air."*[50]

the parking

The parking floors, at the bottom 19 storeys of the Marina city towers, are one of the many innovative and audacious features of the project. It is indeed not usual to see parking occupying such noble floors with views (due to cost-effectiveness and aesthetic reasons) - parking is normally assigned to underground areas or to rough adjacent buildings (with none or little natural light), and vehicles are most of the times hidden from the sight of the city.

On the one hand, the fact that the parking zone becomes perceivable from a city perspective may be a way of reinforcing the character of the project as the *confluence point* of two transportation systems: as stated above, the Marina City housing is the terminus of the Chicago River - accessible from a wharf - and vehicular traffic, culminating in a spiral traffic structure. It might also be seen as an attempt to extend the city fabric – the roughness of the street – towards the inside of the building, as a form of articulation between city and building; allowing for external users to park therein is just as if part of the building had been handed out to the city.

Yet, although this feature might look thrilling for a city passer-by - *"imagine cars weaving their way upward along the ramps (…) driving nineteen floors up in the flat context of Chicago"*[51] – the real effects might be more of separation rather than of real connection to the ground. A tower that has its first 19 floors of an open-air dullness might generate a feeling of void and roughness that, from a street perspective, can possibly mitigate the appeal of the housing located at the upper floors.

49 In "Marina City: A New Concept for Urban Living", *Journal of Property Management*, Summer 1961, pp. 229-36, Goldberg described the many innovations of his Marina City concept, claiming to define a new housing type for the central city.

50 Sarah Whiting, "Speculating beyond iconicity", *op. cit.,* p. 145.

51 *Ibidem.*

Marina City - parking / view from the street
Source: http://i264.photobucket.com/albums/ii181/marcus_a_j/DSC02739.jpg

Actually, although the Marina City towers may recall – in terms of shape, functional mix, and the parking floors at the base – the utopian plans of Louis Kahn for the city centre of Philadelphia that we have mentioned above, this project embodies opposite principles, as it doesn't seem to be a product of aggregation or association with the urban topography.

Nonetheless, it would be fair to say that this particular strategy of locating parking at the lower levels of the towers may contribute to the comfort of the inhabitants. On the one hand, the parking areas are already a pleasant, luminous space with views (opposing the usual darkness and roughness of the parking areas). On the other hand, almost like in a villa typology, the inhabitants are offered the chance to park their cars right next to the house-door, in a covered area, with direct connection to their home door by elevator. Additionally, the parking zone may function as a buffer between city and the apartments, allowing for silence, better views and mainly, privacy – as the office area of Marina City is very close to the towers (if we observe the section, housing is located from the end of the height of the office building upwards.

The Marina City conciliates many strategies that have been tested in previous projects – in terms of mix of uses, connection with the city, quality of housing - thus being a key paradigm of a modern skyscraper. Yet, the epitome of the vertical hybrid was yet to be built: "*Questioning the modern skyscraper in practice rather than in theory, Marina City opened up a dialogue concerning the skyscraper's section and its functional organization that culminated in Chicago in Skidmore, Owings and Merrill's John Hancock Center only a few years later*"[52].

The John Hancock Centre (1968), S.O.M.

the *monolith hybrid*

Built shortly after the Marina City, another interesting paradigm of *hybrid building containing housing* eventually became a new iconic acme in the skylining of downtown Chicago[53]. The John Hancock Centre (1968), designed by Skidmore, Owings & Merrill, was the first built example to embody the quintessential principles that, in 1906, had been attributed to Starrett's very first idea of *hybrid building*[54].

52 *Ibid.*

53 Albert Bush-Brown, *Skidmore, Owings & Merrill 1973-83 – Architektur und Städtebau*, Hatje, Stuttgart, 1983, p. 103: *"Chicago's John Hancock Center ("Big John") and Sears Tower are popularly admired for lofting Chicago's scale and skylining Chicago's vitality, even its audacity."*

54 We are referring to the principles proclaimed by Theodore Starrett in the *One Hundred Story Building* (1906, NY).

façade

parking - exterior access platform

The John Hancock Center, Chicago
Photographs by Ezra Stoller, Princeton Architectural Press, New York, 2000

the functional mix

Within the sharp envelope of the John Hancock tower, the various uses are stacked by floor: commercial space at the bottom, on a below-grade square; five levels of lobby and additional commercial space above that; parking for 750 cars on floors 6 through 12, 76645 m^2 of office space on floors 30 through 41; a 'skylobby' for the residents at floors 44 and 45, including a health club and other amenities; 703 rental apartments on floors 46 though 92[55]. Finally, at the very top of the tower, an observation deck, dining facilities, broadcasting facilities and mechanical equipment are available to the public, solidifying the 'urban' acuity of the building and its vertical character as a linking track between two 'urban' zones (the city and the 'city within the building'). "*The below-grade level of the typical mixed-use high-rise increasingly functioned as a transportation hub, serving the retail businesses on the lower floors, while lobbies brought public space into the interior, uniting the various points of access to the building and linking circulation pathways with the urban fabric.*"[56].

Despite embodying a functional variety comparable to the one seen above in Marina City, a fundamental volumetric difference between the two is clear and must be stressed: while the former distributes uses through different volumes and levels (a combination of exterior and interior spaces), the John Hancock Centre concentrates the multiplicity of 'urban' uses within "*one unitary and minimally differentiated mass*"[57]. Indeed, this building takes one step forward towards the incarnation of the unity and compactness of the Big Building, as it includes even public spaces and parking within its walls: "*(John Hancock Centre) was the first structure to realize the concept of the Vertical City, embodying an idea of a skyscraper in which self-sufficiency is a specific alternative to the modernist model of centrality.*"[58] The *urban concept* that is inherent to this building relates not only to the coexistence of housing, retail and workplaces (the work-life model that allows people to spent most of their daytime within a building), but also to the distribution of functions in section - "*The section is the key element that articulates the complex nature of stacking functions vertically*."[59] – with commercial space at the bottom and housing occupying the upper (and narrower) floors of the building[60], according to

55 Building description as per Yasmin Sabina Khan, *The John Hancock Center*, Princeton Architectural Press, NY, 2000, p. 3.

56 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice, op. cit.,* p. 236.

57 Scott Johnson, *Tall Building: Imagining the Skyscraper, op. cit.,* p. 63.

58 Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, *op. cit.*, p. 6.

59 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice*, *op. cit.*, p. 236.

60 *"The tower's tapered shape was chosen in order to match the different floor space requirements that decrease from bottom to top — from the entrance and commercial zones at the base to the clusters of small apartments at medium height and finally to the large apartments on top, where relatively less space is needed for ancillary rooms with artificial lighting."* See more at: http://www.som.com/projects/john_hancock_center#sthash.yWnFVGoj.dpuf (20.04.2016).

parking (1970)

sky lobby (1970)

44th floor swiming pool (1970)

The John Hancock Center, Chicago

Photographs by Ezra Stoller, Princeton Architectural Press, New York, 2000.

height and footprint parameters[61]. This 'tapering strategy' has been at the origin of a hierarchical model of distribution that ultimately guided the conception of several skyscrapers: "*The John Hancock project marked the beginning of American skyscraper design in which functions were planned using a logic replicated elsewhere: the degree of privacy increased as one moved up in section. The below-grade level of the typical mixed-use high-rise increasingly functioned as a transportation hub, serving the retail businesses on the lower floors, while lobbies brought public space into the interior, uniting the various points of access to the building and linking circulation pathways with the urban fabric.*"[62] Additionally, public spaces (observation decks, restaurants) started to become usual amidst the skyscrapers, as seen at the John Hancock Centre, reinforcing the vertical urban logic of the building.

This vertical stratification of functions is unperceivable from the outside, as the volume is unitary and the façade treatment is similar for all the different functions/ levels – even public space and parking are completely camouflaged – as if the building was one big box filled with disparate functions. For that reason, Fenton categorizes the building as a '*disparate hybrid*' – the term attributed to buildings that are "*formed by the economics of constructing the largest volumetric package and then filling it with a combination of independent functions*."

Being one of the very few examples in Joseph Fenton's catalogue containing housing, the fact that the author presents the 100-story John Hancock Center aside the very seminal example of hybrid – *The One Hundred Story Building* (1906, NY, Theodore Starrett) is certainly not arbitrary. The similitudes between the two schemes are irrefutable: the functional diversity of the city is stacked vertically, within a large-scale envelope (both 100-floors high) – *"a single structure on a single urban block could become the life nucleus and sole support of the people within"*[63]. And indeed, the John Hancock Center seems to be, at last, the realization of the hybrid's fundamental aspiration – becoming, *a city within a building (within a city)*[64].

parking

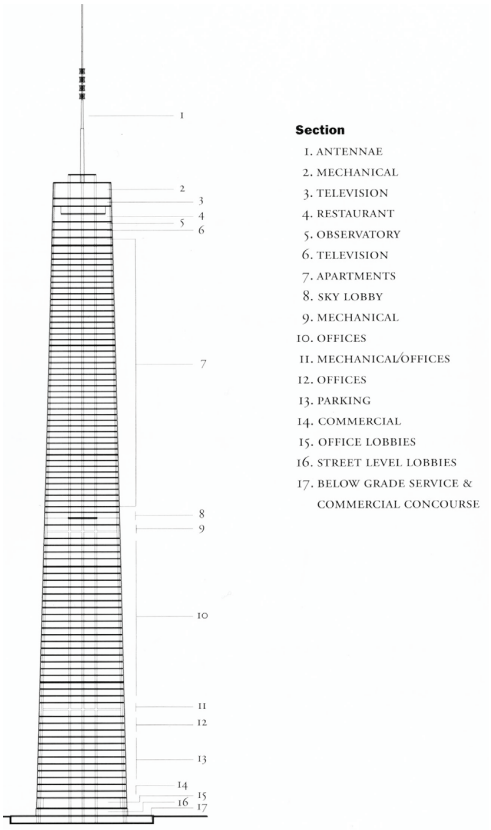
We have seen above that the planning of parking areas plays an important role in the overall concept of the hybrid buildings. The John Hancock centre is one of the few examples where 7 parking floors are elegantly integrated within the volume, remaining unperceivable from the outside (a feature that most of the times can't be accomplished due to cost reasons). In this particular case, the vehicles access the parking levels via a concrete spiral ramp structure located next to the building - on the east side of the main tower that connects to it on the sixth floor -, allowing for a

61 Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, *op. cit.*, p. 6.

62 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice*, *op. cit.*, p. 236.

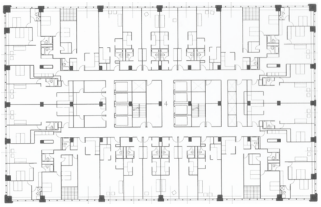
63 Joseph Fenton, "Hybrid Buildings", in *Pamphlet Architecture no. 11: Hybrid Buildings*, *op. cit.*, p. 33.

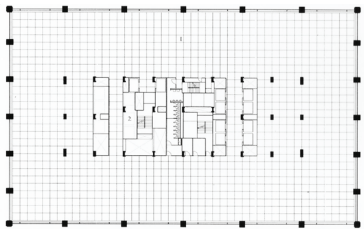
64 *Ibidem.*

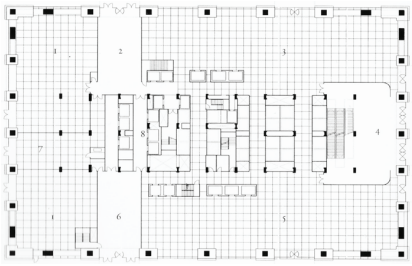


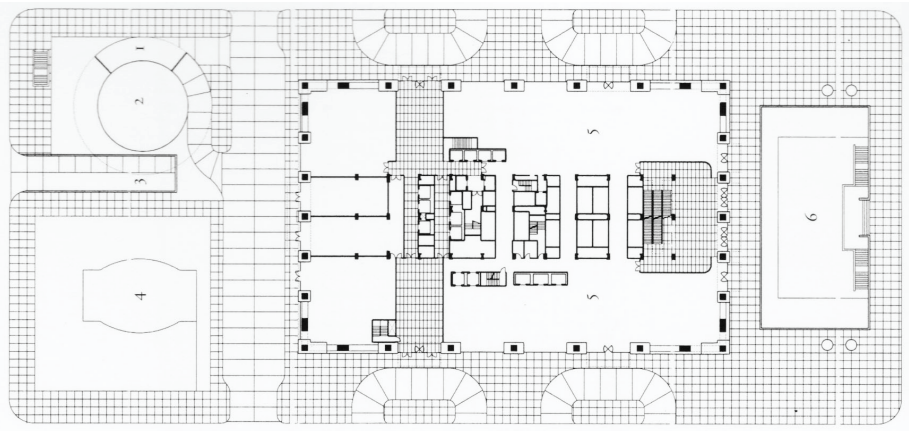
Section

1. ANTENNAE
2. MECHANICAL
3. TELEVISION
4. RESTAURANT
5. OBSERVATORY
6. TELEVISION
7. APARTMENTS
8. SKY LOBBY
9. MECHANICAL
10. OFFICES
11. MECHANICAL/OFFICES
12. OFFICES
13. PARKING
14. COMMERCIAL
15. OFFICE LOBBIES
16. STREET LEVEL LOBBIES
17. BELOW GRADE SERVICE & COMMERCIAL CONCOURSE









The John Hancock Center, Chicago

Photographs by Ezra Stoller, Princeton Architectural Press, New York, 2000

maximization of the usable parking area inside the building, for the liberation of the bottom floors of the towers, and also for the absolute comfort of users, who get to park their cars already in interior naturally lit space. This feature helps reinforcing the truly exceptional character of this building, as a congregator of the majority of urban features, even those belonging to the roughness of the streets, like cars.

housing

The "*high-class residential*"[65] typologies found at John Hancock Centre are three: studio, one bedroom and two-bedroom apartments - seemingly focused on the same 'small family-types/workers' that we have seen in Marina City. The floor plan repeats all through the 46 floors, with only a few large and expensive apartments occupying the top portion of the shaft. Despite the repetitive and expensive scheme, housing has met an immediate success at John Hancock Centre, as reported by the Chicago Sun-Times right after the building's completion, describing how the inhabitants enjoyed to live in this high-rise scheme, after coming from the suburbs to the tower[66].

the restrictions of the vertical scheme

The clever structural scheme of the building – "*the gutsy, masculine, industrial tradition of Chicago, where structure is of the essence*"[67] also explains the immediate success of "*Chicago's Multi-use Giant* » as per the review of the project published in *Architectural Record*[68]. Yet, despite the seducing clarity of the single-object scheme, it revealed to be quite inefficient in terms of cost. "*The single-tower scheme was clearly the best programmatic solution, but the cost of the construction was an impediment.*"[69] Moreover, some further disadvantages associated to the functional diversity in vertical monolith hybrids started to become evident in this project. A quick glance at the plan is enough to recognize that the multiplication of vertical circulation cores (responding to flow and security issues at once) and the space that these occupy in the floor plans lead the floor area ratio to become quite inefficient and hence very expensive, as much as the growing dimension and complexity of the building leaves space for less social interchange, while it may increase the number of security issues[70].

65 James S. Hornbeck, "Chicago's Multi-use Giant", *Architectural Record*, vol. 141, n1, 1967, p. 138.

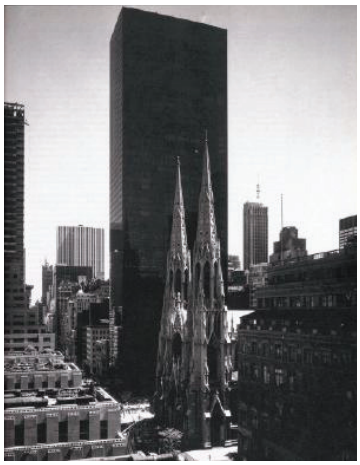
66 Rob Cuscaden, « Living in the Sky Almost Heaven », *Chicago Sun-Times*, 14 January 1971.

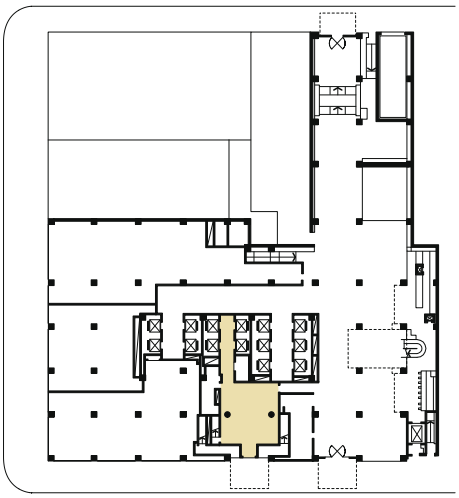
67 Fazlur R. Khan, « The John Hancock Center », *The Building Official*, December 1969, p. 69.

68 James S. Hornbeck, "Chicago's Multi-use Giant", *op. cit.,* pp. 137-144.

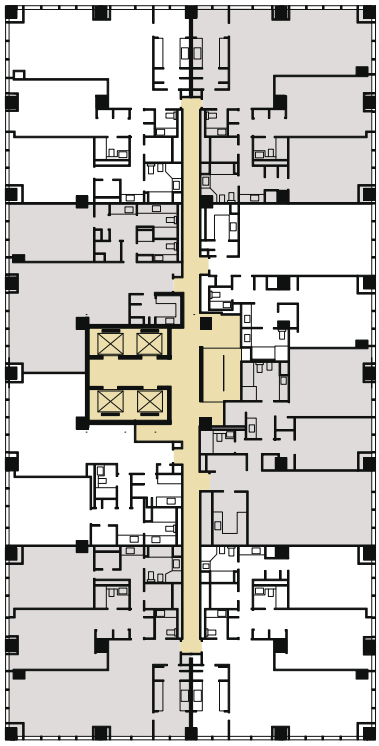
69 Yasmin Sabina Khan, *The John Hancock Center*, *op. cit.,* p. 3.

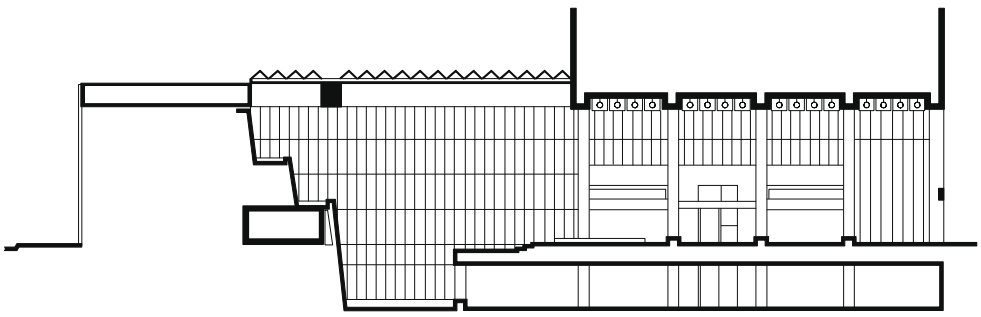
70 Nonetheless, some arguments have been strong enough to allow the construction: "*the sole building would cover less of the total site area, objectionable views between proximate buildings would be avoided; and the apartments would be far removed from the hustle and bustle of the street. In addition, the 'world's highest' residences, with their spectacular views of the city and the lake, would command the greatest profit for the developer*", in Yasmin Sabina Khan, op. cit., p. 3





Ground Floor Plan





Typical Floor Plan & Section Through Ground Floor 1:500

Olympic Tower, SOM, New York, 1976

Source: plans by Hilary French, 2008.

The Galleria (David Specter, 1975)
The Olympic Tower (S.O.M., New York, 1976)

Manhattan and the *hybridisation of the public space*

In the early 1970s, planning regulations affecting midtown Manhattan created incentives for the construction of mixed-use buildings, offering additional floor area to the developers. These incentives were accompanied by "requirements for the provision of public space, which led to the integration of interior walkways, galleries and glass atriums within buildings of this type"[71]. The Galleria (David Specter, 1975) and The Olympic Tower (S.O.M., New York, 1974) have been the first monolithic hybrids built in New York City under these conditions, representing key opportunities to test the public acceptance of this model - "*They were practical experiments, subject to observation and analysis by critics, architects, urban planners and developers*"[72].

The Galleria, NY, 1975, was the first to be built under these new regulations, respecting the required introduction of shopping malls on the ground floor and large atriums, articulated with housing and office space. *"The addition of housing obliged the introduction of structural changes to the traditional office skyscraper: intermediary technical floors, separate lobbies and fragmented vertical transit»*[72].

the hybrid building and the public space

The hybrid building contains a succession of multiple disparate programs organised around a central 'spine' of vertical transportation, functioning as an urban fabric stretched over a vertical axis. Active 24hours a day, these buildings triggered a significant twist on the urban logics "*for the ways in which centrality was dispersed throughout the city*" [73]. The character of the public space also began to change with the arrival of this building type, with a fraction of the public space of the city becoming interiorized. Suddenly, the city existed not only throughout its horizontal reticule, but also vertically, mutating into a more intricate three-dimensional system[74]. This effect was probably more theoretical than practical, as these buildings were mostly models of self-sufficiency, and eventually, "*this change produced disjunction between the initial goals of the politics of urban renewal and the actual realization of these goals*."[75]

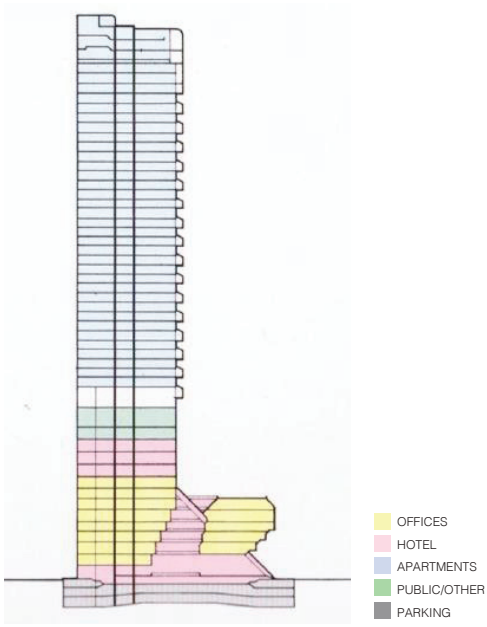
71 Iñaqui Abalos, Juan Herreros, *Tower and office: From modernist theory to contemporary practice*, *op. cit.*, p. 240.

72 *Ibidem,* p. 240.

73 *Ibidem,* p. 29.

74 The Citicorp Center (Hugh Stubbins, New York, 1978) contributes to our enlightenment on questioning the real potentials of interiorized public space – whether it is really a principle to be followed. What stimulates better articulation between building and city? Having exterior public space at the base of the building or inviting people to enter the building and go some floors up to find public space? Since it occupies most of a Manhattan city block, Citicorp avoids competing with similar neighbouring buildings, forming a complete and self-sufficient vertical entity. Moreover, the direct connection to the subway incites the building's protrusion with the broad urban transportation network, and thus stimulating a strong three-dimensional link.

75 Inaki Abalos, Juan Herreros, *Tower and office: from modernist theory to contemporary*



The Galleria, NY, 1975, Section.
Source: a+t, *This is Hybrid*, 2012

The Galleria, NY, 1975.
Source: https://s-media-cache-ak0.pinimg.com/564x/34/41/a5/3441a58158acc1b42274cbaf58f3c152.jpg

A closer look at the Olympic Tower allows us to conclude that these models represent forms of condominiums, rather than actual extensions of the city. Within its 50 storeys, the Olympic Tower contains 225 condominium apartments (that have promptly been sold) and more than 23,000 m^2 of office space and retail space. "*Olympic Tower is an unusual apartment house in two respects. First, it combines, in one building, retail stores, a parking-like public shopping arcade, commercial office space and apartments. Second, it provides many of the facilities and services one expects of a hotel, augmented with a number of extra ones.*"[76] The living concept extends to a series of unlikely extra facilities: a health club, a wine cellar, a stock quotation board, a maid and valet service, a hairdressing salon, a barber shop. At street level, separate lobbies allow access to offices and to the apartments. Luxury has been the assumed aspiration of this scheme, which is known for having housed some of the most luxurious condos in the world at that time. "*The two highest floors contain several very large duplexes while the rest of the residential portion of the building consists of eight luxurious but basically conventional apartments to a floor*"[77]. Ironically, the slogan used for the building's propaganda was 'The Jet-set Unité for Manhattan' *"because its programme had so much in common with Le Corbusier's ideas for the vertical city"* although it was *"greeted with cynism that the reality would be an ivory tower for the super rich*"[78]. It is thus easy to understand that the initial principles that have endorsed the construction of this building served as a form of promoting gentrification, rather than sustaining the purposed of urban renewal. There is also not much to be said on the analysis of the apartments and its typical floor plan. Nonetheless, one shouldn't overlook the thrill that the idea of living and eventually working on a 'self-contained city' might represent.

verticality vs. horizontality – the enrichment of the Vertical Space

Some challenges inherently linked to the conception of the vertical monolith hybrids are implicit in the examples described above. By analysing the plan, we observe that the multiplication of vertical circulation cores (responding to user flow and security issues at once) and the surface they occupy in plan, make the floor area ratio become quite inefficient and extremely expensive, leaving no space for social aspirations[79]. Indeed, while horizontal space symbolizes a kind

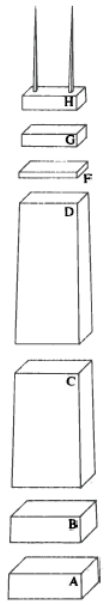
practice, op. cit. p. 240.

76 Andrew Alpern, *New York's fabulous apartments*, Dover Publications, New York, 1987, p. 158.

77 *Ibidem,* p. 158.

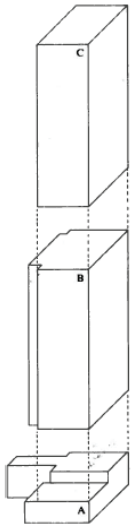
78 Hilary French, *Key Urban Housing of the Twentieth Century*, King Publishing, London, 2008, p. 146.

79 Inaki Abalos & Juan Herreros's have focused on the research on verticality, mainly on the analysis of the relationship between multi-functionality, envelope and footprint. They classify their selection of high-rise buildings as a synthetic and dense solution for the organization of disparate functions. Abalos & Herreros use drawings in section to establish a comparative analysis of different projects that superpose different activities and suggest the stratification and the juxtaposition as strategies to avoid the isolation of activities. Simultaneously, they underline the fact that these buildings are the result of an overall system of density and urban growth, contrasting with the planning strategies we have seen in the past, where the number of inhabitants of a complex used to determine all contiguous



A. Stores
B. Parking
C. Offices
D. Apartments
E. Health Club
F. Observatory
G. Restaurant
H. Television Studios

John Hancock Center (1968; Chicago, Illinois, S.O.M.)



A. Stores
B. Offices
C. Apartments

Olympic Tower (1976, NY, S.O.M.)

Source: Joseph Fenton, «Hybrid Buildings», Pamphlet Architecture n. 11, New York San Francisco, 1985.

of sociable and barrier-free access, verticality presents obstacles to movement and visibility, separating activity on one floor to the next. Horizontal space is epitomized as being flexible, possible to organise into shades of public, semi-private and private, whereas the vertical extrusion of similar floor plates inherently implies separation[80]. Moreover, from a builder's point of view, it is normally easier and less costly to construct a single use over many nearly identical floors than to stack multiple different uses vertically, since each different layer implies different technical and architectural solutions[81].

As the multiplicity of vertically stacked functions increases within the hybrid envelope, some issues can be identified:

- the access core increases in size and the floor area ratio becomes less efficient due to the multifunctional stacking and the usual need to provide different elevators to different uses;
- the interconnection/exchange between uses declines (the elevator acts as shortcut, mitigating the potentials of interaction);
- relations between different programs become less natural;
- the program placed at the ground remains important, rooting the building to the urban fabric;
- the apartments have standard, repetitive and speculative floor plans and are luxurious.

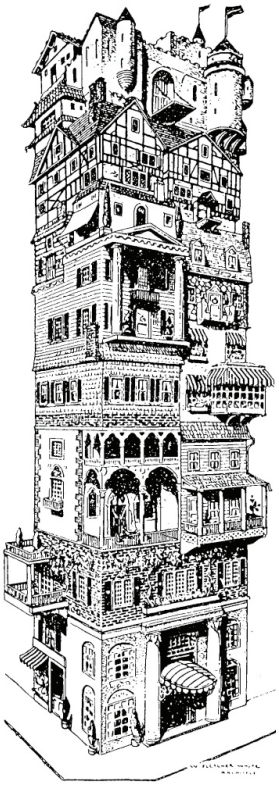
The abstraction of the typical plan
the seek for humanity within vertical schemes

The adaptation of a high-rise building to human habitation would a priori imply the multiplication of individual spheres of living. The notion of the *human module*, be it a home, an apartment, an office or a workstation is implicit in the skyscraper. However, what is observed is a sort of annulation of such humanity towards the conception of a model of abstraction and speculation. Rem Koolhaas associates the term "typical plan" to the American skyscraper – "*Typical plan is an American invention. It is zero-degree architecture, architecture stripped of all traces of uniqueness and specificity. (…)* Typical plan is a quantum leap that provokes a conceptual leap. An absence of content in quantities that overwhelm, or simply

functions; and functions where planned to serve inhabitants within a closed system. See Inaki Abalos, Juan Herreros, *Tower and office : from modernist theory to contemporary practice*, *op. cit.*

80 The questioning over the vertical/horizontal type had already been raised in the past and is somehow implicit in the Rockefeller Centre (Raymond Hood, 1930-39): "*instead of the ruthless extrusion of arbitrary individual plots, larger sites within a block will be assembled in new building operations*". Despite the implicit formal and underground link among the complex, the public space starts integrating the built complex: "*The space around the towers within the blocks will be left unbuilt, so that each tower can regain its integrity and a measure of isolation.*" The space was alive and active, with an underground plaza and a commercial gallery connected by pedestrian walkways and with direct access to subway lines. "*The Rockefeller Centre, with this diversity of functions, acts as a true city complex, which takes the influence of the mixed uses of the single building beyond itself and into the entire city*". Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, The Monacelli Press, New York, 1997, pp. 162-233.

81 Scott Johnson, *Tall Building: Imagining the Skyscraper, op. cit.,* pp. 58-66.



'SITE credits both Walker's 1909 cartoon and this 1920 one, also from Life, as "antecedents" for its "Highrise of Homes" project, but Walker's image is clearly the critical inspiration and model'.

Source: full text description extracted from http://www.architakes.com/?p=1687

'In the 1980s, Walker's Life cartoon inspired the "Highrise of Homes" project by James Wines and his firm SITE, a fantasy of highrise housing that would allow individual freedom and expression. As described in SITE's Highrise of Homes publication (Rizzoli, 1982, p.41), "The two most obvious antecedents for the Highrise of Homes are the amusing 1909 drawing of a proposal for a skyscraper as a utopian device and the 1920 fantasy depicting a cooperative apartment house built according to the owners' individual tastes. It should be noted, however, that these examples point up the difference between a casual joke and a topic of substantive research, and have been included here with hopes that a comparison of intent will work in favor of a better understanding of the Highrise of Homes." While this statement fails to acknowledge how literally the project builds on Walker's image, SITE's fleshing out of his cartoon's outlines and dense proliferation of its plantings transforms the cartoon into a different kind of art and anticipates a trend found in today's green skyscraper proposals'.

Source: full text description extracted from http://www.architakes.com/?p=1687

pre-empt, intellectual speculation""[82] Although his reference to the concept of *habitat* is quite superficial, he states his critical standpoint with an undertone of acceptace: "*Did the plan without qualities create men without qualities?"*[83]

It was seemingly in this sense that some recent design experiments dared to test the simple repetition of floors. A prominent figure in that movement is James Wines and SITE [image]. Departing from the same model – the American hybrid – they test a more humane approach to habitat, arguing in favour of the importance of "*indeterminacy, idiosyncrasy ad cultural diversity through spontaneous acts of choice, chance and change*"[84]. SITE's proposal for a new kind of skyscraper – Highrise of homes (1981) – illustrated 15 to 25 story frame structure files with highly individual, traditional, and banal images of single family homes disposed around a central core.[85] Opposing the quintessential nature of the skyscraper - a vertical extrusion of similarly inhabited floors[86]. The project focused on providing opportunity for individual statements of identity. Intentionally, the imagery produced for this project retakes emblematic American Models illustrated with a graphic style that clearly recalls Le Corbusier's drawings.

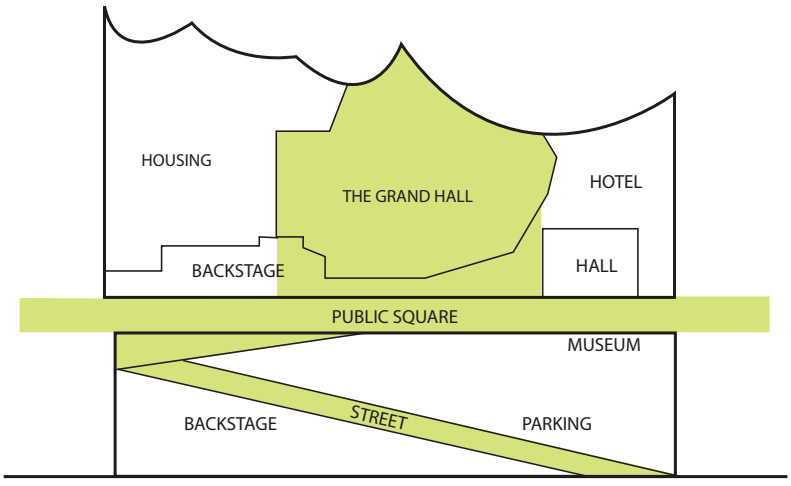
82 Rem Koolhaas, Bruce Mau, *S M L XL*, Monacelli Press, New York, 1997, *op. cit.*, p. 335-345.

83 *Ibidem,* p. 346.

84 James Wines, "Preface, SITE: Identity in Density", in *Green Architecture,* Taschen, Köln, 2000, p. 8.

85 Patricia Phillips, James Wines, *Highrise of homes*, Rizzoli, New York, 1982.

86 See Scott Johnson, "The enrichment of vertical space", in Scott Johnson, *Tall Building: Imagining the Skyscraper, op. cit*. p. 58.



Author Diagram

2.2.6. Functional Mix and Spatial Complexity Today's"Big Building"

As a mixed-use model, the Big Building is said to embody a step-forward on the complexity implied in the design process, maily when compared to the different categories of buildings that we have seen above[1]. This relates not only to its increased size and functional diversity, but also to the intrinsic translation of urban logics of density and mix within an enclosed and a clearly defined envelope[2], often "*combining functions of an entire town or city*"[3] within its walls. In addition to that, its conception implies bringing together a larger diversity of programs belonging to public and private spheres: "*structures able to combine different programmes and encourage the interaction of a disparate sequence of urban uses, combining private activities with the urban realm.*"[4]

In that sense, the paradigm of the Big Building goes far beyond the one of scale or pure functional mix – it refers, extensively, to the "*combination of public and private interests in housing, public space and civic facilities, aiming to respond to major concerns of our society: the land scarcity and its elevated cost; the need for intensifying available land in order to contribute to sustainable development; the need for densifying uses in order to revitalise urban centres and restraining the city sprawl*"[5]. Aside with these parameters, one shouldn't forget that factors like speculation and globalization might also play an important role on the conception of these buildings.

It is interesting to state that a lot of recent architectural publications make a renewed use of the label "Hybrids"[6] (with implicit reference to the 'American Hybrids') as they refer to the Big Building, suggesting even their advent as some sort of "*re-emergence of the hybrid building*."[7] Curious is also the fact that, for being "*bigger, taller and wider built-forms*" [8] Big Buildings also easily relate to the Modern

1 The fact that mix has to be, as a whole, articulated within a container, its conception - ensuring overall spatial quality and efficient articulation – becomes the most complex of all planning challenges.

2 The definition above may sound like we're planning to come back to the utopia of the megastructures (circulation and building within a single acclimatized environment), but the complex challenge we're referring to sets its base on different motivations, very much linked to current times.

3 Aurora Fernandez Per & Javier Mozas, *Hybrids I. High-Rise Mixed-Use Buildings*, a+t n.31, 2008, p. 15.

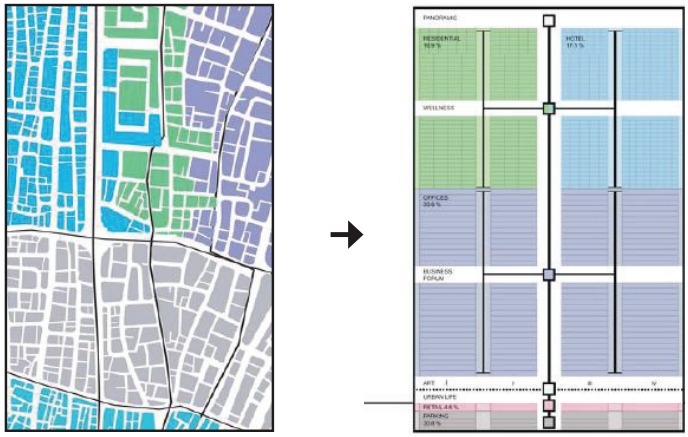
4 *Ibidem*, p. 15.

5 Aurora Fernandez Per & Javier Mozas, *Hybrids I. High-Rise Mixed-Use Buildings*, *op. cit.*, p. 3.

6 Aurora Fernandez Per & Javier Mozas, *Hybrids I. High-Rise Mixed-Use Buildings*, op. cit.; Aurora Fernandez Per & Javier Mozas, *Hybrids II. Low rise Mixed Use Buildings,* a+t n.32, 2008; Aurora Fernandez Per & Javier Mozas, *Hybrids III. Residential Mixed-Use Buildings*, a+t n.33/34, 2009.

7 Aurora Fernandez Per & Javier Mozas, *Hybrids I. High-Rise Mixed-Use Buildings*, *op. cit.*, p. 5.

8 Edward C. Relph, *The Modern Urban Landscape: 1880 to the Present*, JHU Press, 1987, p. 243.



concept diagram: urbanism within a building

program diagram

OMA, Dubai Renaissance

Source: © OMA

Megastructures on the one hand, and set apart from this architectural trend on the other. Theorized by Reyner Banham[9] in the 1960s and 1970s as being "*modular, extensible, prototype city structures*"[10], we have seen that the few models actually built at the time were no less *inflexible and hard*.

This idea of "intensification" is what makes the Big Building differ from the previous model. Although we have classified above the *Unité d'Habitation* as 'the quintessential Big Building' - for its character of object and the associated ideas of functional mix and self-contained urbanism, aside with the predominance of housing as program - some recent realisations bear witness to an increased size, complexity, but mainly to an urban setting that forces the use of new tools of design and analysis. At the same time, whereas the example of the *Unité d'Habitation* was thought to be located outside the city centre, the Big Building is normally located in areas of high density within the city. In that sense, the effects of the Big Building, concerning scale and the relation (or non-relation) between building and city[11] have been repeatedly been mentioned in Rem Koolhaas's theorems in the 1990s[12], mainly in the manifest of Bigness[13]. Rem Koolhaas elaborates indeed five fundamental theorems for Bigness to conclude that, with all the breaks implicit in the Big Building, - "*with scale, with architectural composition, with tradition, with transparency, with ethics - it implies the most radical break: BIGNESS is no longer part of the city. It exists; at most, it coexists. It replaces the city; it becomes the city*"[14].

Rem Koolhaas's statement seems to be indeed giving up: it isn't worth trying to connect the Big Building with the city because it will never be a part of it; it will always be an exception, another city/'living organism' on its own. This is possibly why there isn't much varation or reflection on his design of Big Buildings according to context (be it New York, Rotterdam or Dubai), or any effort to connect the building with the city either. One of the most extreme projects to illustrate his thinking is possibly the non-built Dubai Renaissance (2006). Described as a project where *"the desire to make a city arises"*[15], it is said to be *"a revision of the Modern Skyscraper, although bigger and more daring: a monolithic envelope containing all*

9 Reyner Banham, *Megastructure – Urban Futures of the Recent Past*, Thames and Hudson, London, 1976.

10 *Ibidem.*

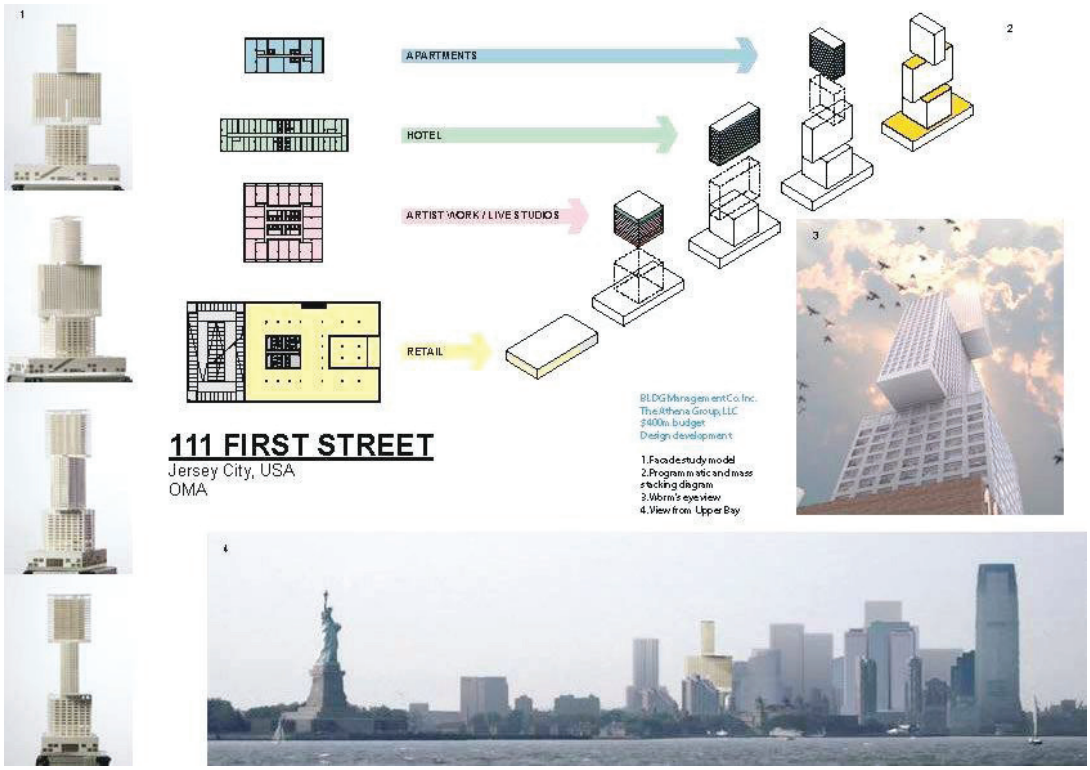
11 The Bigness theories relate mainly to the object and its difficult relation with the city, referring only very vaguely to interior dynamics, functional mix or articulation spaces. The query of housing isn't referred to at all in his text.

12 Although Koolhaas's observations have been written almost twenty years ago, we can still verify its validity as we analyze recently completed examples of Big Buildings.

13 Rem Koolhaas, Bruce Mau, « Bigness or the problem of Large », in *S,M,L,XL*, The Monacelli press, 1995, pp. 495- 516

14 *Ibidem.*

15 Aurora Fernandez Per & Javier Mozas, *Hybrids I. High-Rise Mixed-Use Buildings*, *op. cit.*, op. cit. p. 112.


1
APARTMENTS
HOTEL
ARTIST WORK / LIVE STUDIOS
RETAIL
2
3
111 FIRST STREET
Jersey City, USA
OMA
BLDG Management Co. Inc.
The Athena Group, LLC
$400m budget
Design development
1. Facade study model
2. Programmatic and mass stacking diagram
3. Worm's eye view
4. View from Upper Bay
4

programmes without them becoming apparent from the outside."[16] And here the reference to the predecessor model of Big Building – The One Hundred Storey building (1906) - pops up as a clear reference; curiously, designed precisely one hundred years before - and yet sharing the same base concept.

Surrounded by skyscrapers that behave as vertical ghettos, Dubai Renaissance (OMA, 2006) was designed to be a self-contained city with three large public areas distributed along its section. A vertical street – an elevated core – connects them to the main floor without intermediate stops[17]. As if the old horizontal city had been lifted – see diagrams - the Dubai Renaissance building contains a rich section/slice of urban life in a way that is totally accessible by vertical transport.[18] However, as we try to visualize the access core and the possible common areas, we can't predict that much of innovation. The functional mix remains indeed quite similar to the one of the multifunctional tower: underground parking, commerce and art gallery at the base, offices up to half height, hotel and residences at the bottom – all of these interposed with common areas (observatorium, wellness area, etc).

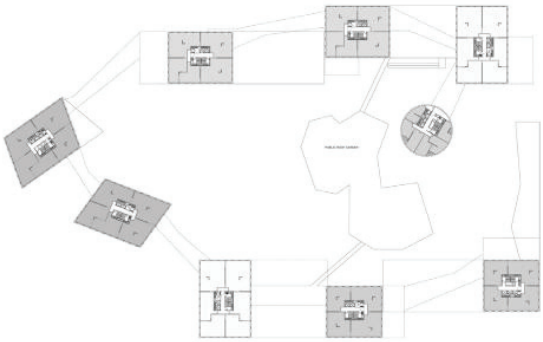
Conceived in the same year and also by OMA, the 111 First Street (Jersey City, USA, 2006 - unbuilt) is a Big Building (111'500 m^2) that plays with shape to explore innovative qualities within the building, focusing a lot more on developing quality spaces for residents (its main program), inviting areas for the public, and areas of encounter between inside and outside users (just like in a normal city life). The project stacks up the programme in three different volumes on top of a podium. Each volume holds different uses and housing typologies (apartments, lofts, artists studios). The rotation of the volumes allows for the opening of exterior terraces. One of them, on the roof of the podium, can be directly accessed from the street so as to incorporate it in the circuit of public activities of the surrounding cultural district[19]. The strategy of rotation might indeed be a clever way to provide a lounge and terrace to the residents and to lend to the mostly residential building a more familiar and social character. At the same time, having a strong base of commerce and cultural activities, as well as an elevated public terrace, might be an interesting strategy to make the building a hotspot in close correlation with the street. At the same time, the fact that the building provides a public terrace, at a lower level, and a private terrace for inhabitant, at a bottom level, might also be interesting for it allows visual life and connection without compromising privacy (if the top and bottom logic was inversed, the privacy could possibly be compromised). The restaurant/bar at a middle level might also become an interesting meeting point between inhabitants and public within the building.

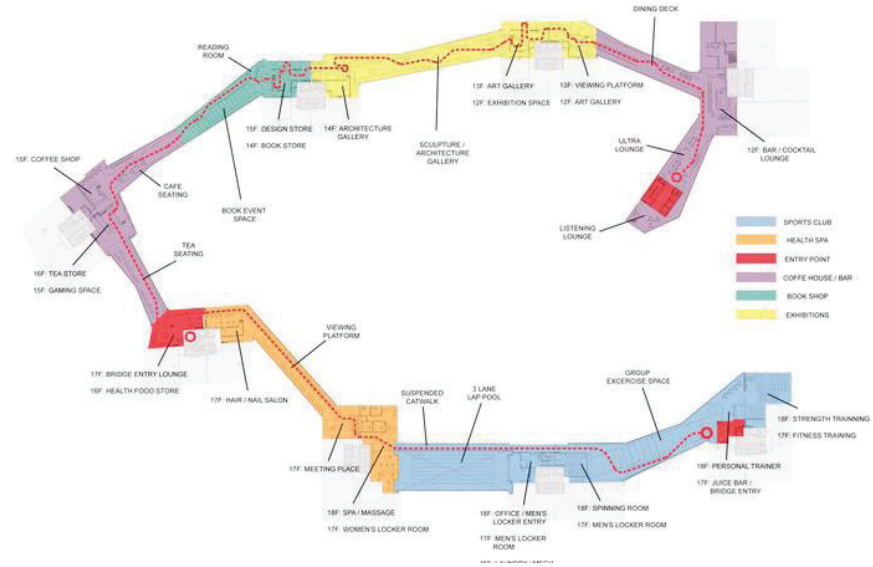
16 *Ibidem.*

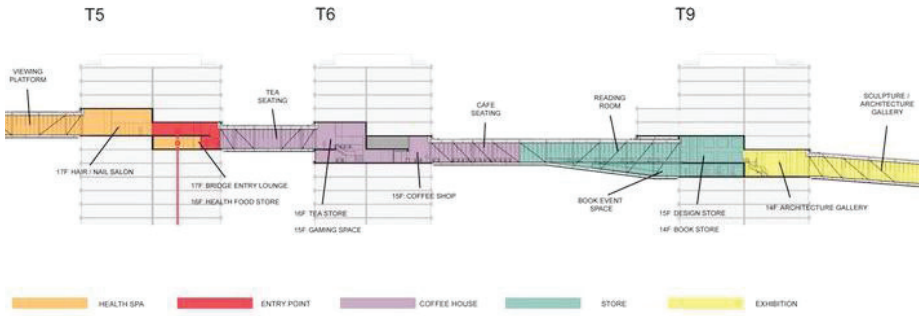
17 *Ibid.*

18 Aurora Fernández Per, Javier Mozas & Javier Arpa, This Is Hybrid, a+t ediciones, Vitoria-Gasteiz 2011. pp. 240-247.

19 *Ibidem,* p. 170.







Steven Holl, Linked Hybrid. Beijing, China (2003 – 2009), 221'500 m²
Source: © Steven Holl
http://www.stevenholl.com

Linked Hybrid (2009), Steven Holl[20]

Besides focusing, a bit more than Koolhaas, on the formulation of interesting articulation strategies between different uses, Steven Holl's recent realisations in China seem to do an effort towards the integration of the building in the urban fabric (despite China's massive vertical density), but also to re-interpret some principles that have been tested before in mixed residential complexes (the elevated streets, the integration of urban features like public spaces and gardens, etc).

Moreover, Holl raises the discussion on the fact that today's hybrid/Big Buiding differs from any familiar architectural archetype and, thus, it triggers 'strangeness'. The archetypal shape of the housing building, the shape of the theatre, the shape of the commercial building get often merged into one peculiar new shape. As a renowned architect of Big Buildings and author of theoretical writings in the subject of hybrids, Steven Holl, refers to that "strangeness" confessing that his projects bear witness to the strategy of creation of a completely new identity: *"I use the principles I described in Anchoring, developing hybrids to create an identity unique to the circumstances of the project"*[21].

The Linked Hybrid complex, with a total area of 220,000 square meters, was built in Beijing, China, between 2003 and 2009, and it seeks to *"counter the current privatized urban developments in China by creating a new twenty-first century porous urban space, inviting and open to the public from every side"*[22]. With its wide variety of cultural programs and activities, the building *"offers a ground-breaking model for mixed use urban space that creates an open city within a city."*[23]

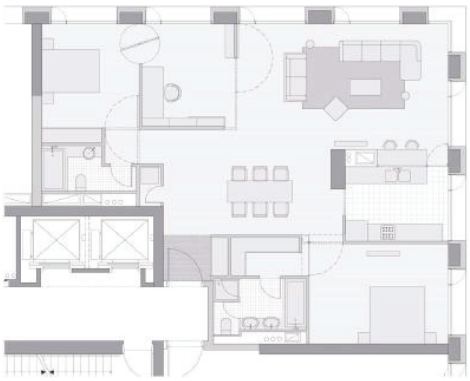
One the one hand, the idea of the Big Building as a monumental scale and form and its detachment from the city is reworked by means of clever design strategies that allow the re-integration of urban elements and programs that succeed at connecting with the city fabric (in a strategy that is not very different from the one we have seen above at the Barbican, for instance). On the other hand, the problems related to large scale housing buildings – isolation, monotony, and ghettoization) have also been avoided through the wealthy program mix that includes leisure and culture activities and invite the rest of the city in. The housing schemes benefit from the building's cut-off shape and get large amounts of light and views. Finally, the building takes a clever benefit from its simultaneous horizontal and vertical deployment axes: the vertical stacking of housing allows for balanced and luminous housing typologies whereas horizontal circulation paths allow for encounter and social proliferation.

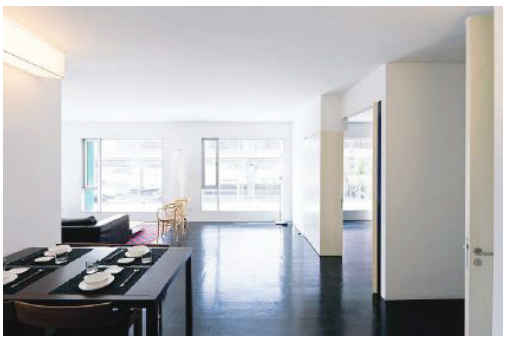
20 Beijing, China, 2003 – 2009, 221'500 m^2

21 Everardo Jefferson, « Holl in Hybrids » *Architectural Design* vol. 75, n.5, 2005, pp. 78-83.

22 Project description in Steven Holl's website: http://www.stevenholl.com/project-detail.php?id=58 (20/05/2016).

23 "Beijing Apartment Complex Creates An Open City Within A City" in *idesignarch*. Source: http://www.idesignarch.com/beijing-apartment-complex-creates-an-open-city-within-a-city/ (20/05/2016).





Source: © Steven Holl
http://www.stevenholl.com

At the same time, the building concept seems to reinterpret the "street-in-the-air" strategy that has been so popular in the 1970s - this time conceived as interior acclimatized space (although with the generous width of an urban street) and anchored in some key functional moments. Within this building, *"the most notable feature is a bridge - or, rather, bridges - high in the air. (...) The idea of the street high above the city is intended to counteract the sense of isolation that high-rise living usually brings, and to create an incentive for residents to walk around the complex. (...) The bridges are spectacular, inside and out, and one can imagine that there will be an allure to walking in the air from tower to tower that having a cup of coffee on the ground can't match."*[24]

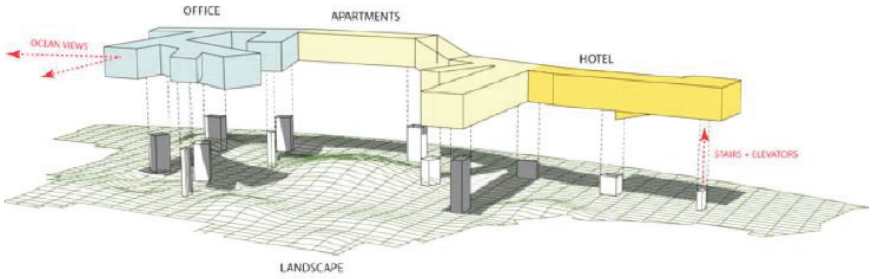
Although the complex contains mainly high standard housing[25], when compared to other Big Buildings containing housing, it remains a lot more reasonable and socially engaged: *"Holl's Linked Hybrid (…) has a surprisingly open, communal spirit. A series of massive portals lead from the street to an elaborate internal courtyard garden, a restaurant, a theater and a kindergarten, integrating the complex into the surrounding neighborhood. Bridges connect the towers above ground and are conceived as a continuous ring of public zones, with bars and nightclubs overlooking a glittering view of the city and a suspended swimming pool."*[26] I that sense, the building seems to acquire an interesting and unique coexistence of horizontal and vertical circulation logics – the vertical axes to access the apartments versus the horizontal/ vertical public streets at higher levels – recalling something between a complex organism or a complex urban fabric with streets at simultaneous different levels.

The ground level of this building offers indeed a wide variety of micro-urbanisms and passageways that allow for people to walk by and ultimately help establishing the bond between the city and the urban ground. The multiple shops located at the ground level further enhance this sense of connectedness and the intermediate level of public/semi-public space, with calm roof gardens, help establishing a certain hierarchy of shared spaces within the complex – bearing a soft transition from the most public and permeable to the most private house gardens. "*All public functions at the ground level, - including a restaurant, hotel, Montessori school, kindergarten, and cinema - have connections with the green spaces surrounding and penetrating the project. The elevator displaces like a "jump cut" to another series of passages at higher levels. From the 12th to the 18th floor a multi-functional series of sky-bridges with a swimming pool, a fitness room, a café, a gallery, auditorium and a mini salon connects the eight residential towers and the hotel tower, and offers spectacular views over the unfolding city. Programmatically this loop aspires to be semi-lattice-like*

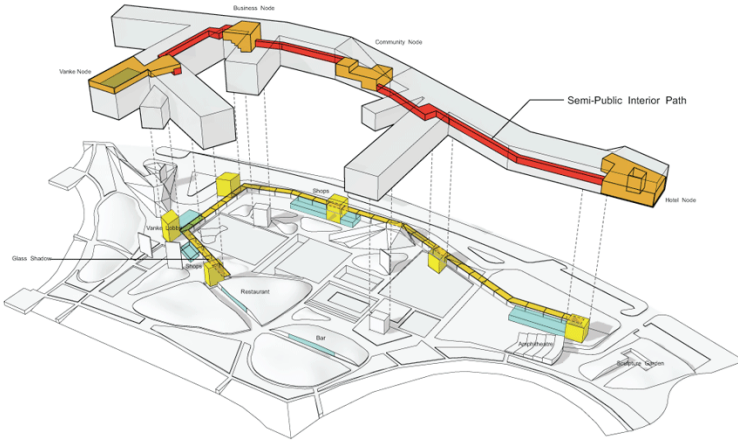
24 Paul Goldberger, "Forbidden cities", *The New Yorker*, June 30, 2008.

25 "*With its eight colorful towers, unusual sky-bridge links, and central diamond-shaped glass structures, Holl's mixed-use scheme stands out from the skyline's more severe concrete skyscrapers. Ecological, luxurious, inspirationally designed, with a community feel and great links to the cultural hub of Beijing […] the Linked Hybrid will mark the city's post-Olympics architectural era – bridging, through design, the East and the West.*", Ellie Stathaki, "Made in China", in *Wallpaper*, June 2009.

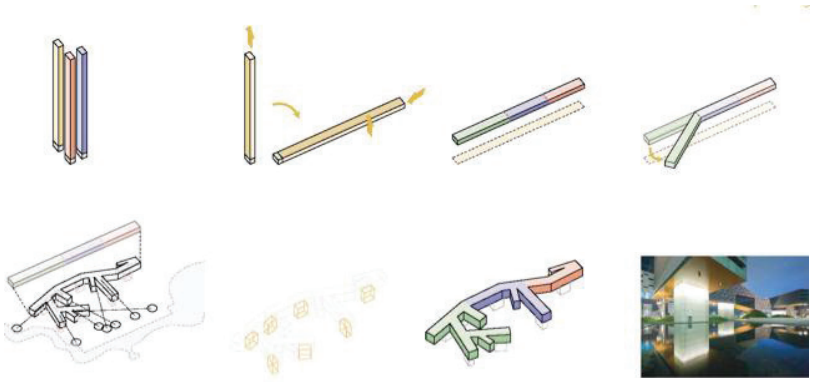
26 Nicolai Ouroussoff, "The new, new city – life in an instant city", *The New York Times - T Magazine*, June 8, 2008.



Program diagram



Circulation diagram



Concept diagram: vertical vs. horizontal

Horizontal Skyscraper - VANKE CENTER, Steven Holl, Shenzhen (China, 2006 – 2009), 120'500 m²

Source: © Steven Holl

http://www.stevenholl.com

rather than simplistically linear. The public sky-loop and the base-loop are expected to constantly generate random relationships. They will function as social condensers resulting in a special experience of city life to both residents and visitors"[27].

Bearing a stronger social character, in terms of its mixed program, than the majority of Big Buildings, the Linked Hybrid has less of an object-like image and looks more like a residential complex (like the above-mentioned models of vertical urbanism). The interest of the 'Linked Hybrid' relies on the fact that it seems to be successful on the articulation of high quality housing and quality urban spaces (even the ones reproduced in interior spaces), and still keeping its bound with the street and the city quite strong and active (the shops contribute to that). At the same time, the fact that there's public space in the middle lends a solid quality to the building. Despite its vertical towers of apartments, the prominence of the base, the raised streets and the homogeneous architectural language lend it the character of a cut-off object, more than a building complex.

Vanke Centre (2009), Steven Holl[28]

In Shenzen, Steven Holl has been given the chance to explore different approaches, not only in terms of program mix, but also in what relates to the built form and its relation to the city. The Vanke Centre is planed as a clear object – "*one single container promotes interaction of uses and users with its semi-public indoor walk that connects the different programmes*"[29], like a traditional vertical skyscraper turned on it's side, yet floating above the ground. This 'horizontal skyscraper' (with a length that equals the height of the Empire State building) hovers over a tropical garden and assembles a multiplicity of uses that include housing, offices and hotel, distributed in sections along the horizontal volume of the building. Under the large green public landscape, some additional services like spa, conference rooms and parking have been included[30].

At the Vanke centre, Steven Holl tests a very different logic from the one applied in the Linked Hybrid. Instead of sewing the building to the ground (taking advantage of the attractiveness of some leisure and cultural functions), his strategy is to make the building float and to leave the garden below open, unrestricted and public. It is interesting to analyse Holl's sketches for the building for they might recall the megastructure drawings by Yona Friedman, an idea that is supported by the project description on the inclusion of an interior public circulation axis: "*covering the entire length of the building a public path connects through the hotel, and the*

27 Clifford Pearson, "Vanke Centre", *Architectural Record*, January 2010.

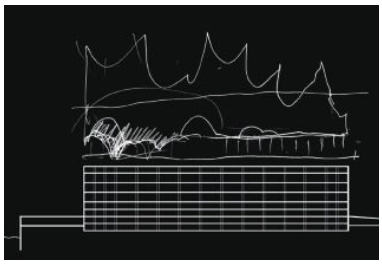
28 Horizontal Skyscraper - VANKE CENTER, Steven Holl, Shenzhen, China, 2006 – 2009, 120'500 m²

29 Aurora Fernandez Per & Javier Mozas, *Hybrids II. Low rise Mixed Use Buildings, op.cit.,* p. 116.

30 Project description at Steven Holl's website. Source: http://www.stevenholl.com/projects/vanke-center (25/05/2016).

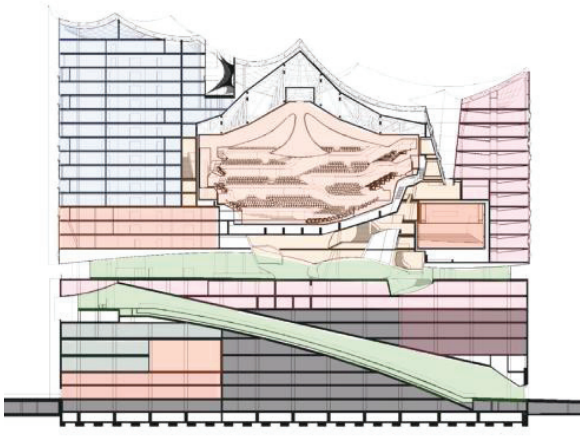
Hafencity Masterplan (KCAP, 2000) + Elbphilharmonie

The Kaispeicher A (Warehouse A), 1990



Herzog & de Meuron Concept Sketch, 2003

Source: © Herzog & de Meuron



Source: © Herzog & de Meuron

apartment zones up to the office wings"[31].

"*The decision to float one large structure right under the 35-meter height limit, instead of several smaller structures each catering to a specific program, was inspired by the hope to create views over the lower developments of surrounding sites to the South China Sea, and to generate the largest possible green space open to the public on the ground level.*"[32]

On the one hand, this building bears possibly more of an 'object character' than the Linked Hybrid. On the other hand, a much larger complexity in uses and connections was seen at Linked Hybrid, despite being twice the size of the Vanke Centre. Moreover, the Linked Hybrid seems to have a much more accentuated social character and to succeed with the idea of connecting with the city (recalling, in some points, the Barbican model). The Vanke Centre on its side, – adopting a strategy that could almost recall the *Unité d'Habitation* – is rather like a 'Building in a park', wishing rather to detach from any form of urban density and rather to deliver a generous green area to the city.

We're not trying, at this point, to make judgement values on one strategy or the other. The context of very high density in which these buildings are located may turn them into successful models anyhow. However, it might be interesting to, at the end of this analysis, go back to the most extreme model of Big Building: embodying a city-like structure within an object, making its different uses work successfully, and independently from its context.

The Elbphilharmonie (2017), Herzog & de Meuron[33]

The idea of mixed uses and high volumetric complexity within an *architectural object* meets its acme at the Elbphilharmonie, in Hamburg, designed by Herzog & de Meuron, with completion planned for 2017. The Elbphilharmonie "*anchors Hamburg's Hafencity (Harbor City) —Europe's largest urban redevelopment project, conceived by KCAP in 2002. Located at the entrance of Germany's main shipping port, the HafenCity*" [image] has been designed around exhaustive urban planning practices, with "*almost half of a metropolitan inner city to use as a live test bed*"[34].

Mostly due to its size and exceptional design features – an 'unusual' form of renovation - the Elbphilharmonie Hamburg is expected to become a landmark/ a monument [35] at the heart of the Elbe. At West, acting like a pivot between the town

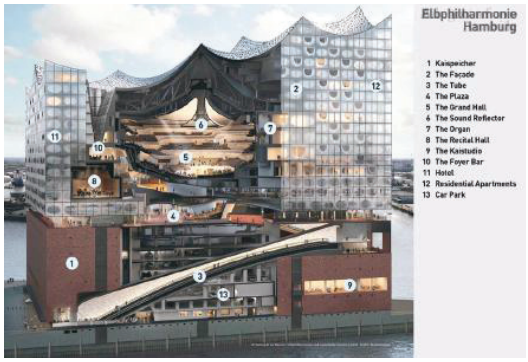
31 *Ibidem.*

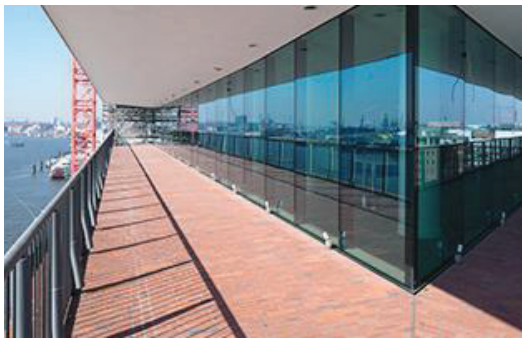
32 The Project description at Steven Holl's website.

33 Herzog & de Meuron, Hamburg, DE, Project 2003 – planned completion 2017, 120,000 m².

34 Greg Oates, "Hamburg Is Becoming Europe's Most Ambitious Urban Design Capital", in *Skift*, July 2014; link: https://skift.com/2014/07/07/hamburg-is-becoming-europes-most-ambitious-urban-design-capital/#1

35 About the monumental character of the Elbphilharmonie, see: Fernando Márquez Cecilia, Richard Levene (Eds.): *El Croquis. Herzog & de Meuron 2002-2006. Monumento e Intimidad. The Monumental and the Intimate*, Vol. No. 129/130, Madrid, El Croquis, 2006.





The Concert Hall
Source: © Herzog & de Meuron

and the port, it extends towards the river. The place occupied by the Elbphilharmonie in Hamburg bears an important historical relevance. "*The landmark of the harbour, the "Kaiserspeicher" with its ball clock, stood there until it was partly destroyed in the Second World War. It's successor, "warehouse A*" [image in the previous page], *designed by Werner Kallmorgen and built from 1963 to 1966, was used as a cocoa bean warehouse until the 1990s, having then hosted regular concerts and exhibitions and initiating its use as a cultural hub*"[36].

functional mix

Herzog & de Meuron's renovation strategy represented on an early concept sketch [image] adds a new glazed upper volume to the existing "Kaiserspeicher", which includes three concert halls - with a central 2,150-seat main auditorium at the hart of the building being its key exceptional piece -, wrapped with an unusual mix of functions that includes 45 luxury apartments, a hotel, a café, an info-center, a museum, concert halls and backstage[37] in a total area of 120'000 m^2 [image]. Paradigm of a clear Big Building, the Elbphilharmonie is already one of the most remarkable buildings in the city of Hamburg and also in Europe, both for its iconicity and for its tumultuous development[38] associated to overdue schedules and excessive costs[39].

Because of the centripetal arrangement of functions established inside the volume, the overall building can no longer be understood through a simple plan or section – the complexity of the scheme demands for a constant articulation of plan, section and axonometric views[40] [image]. This circumstance is related to the massiveness and

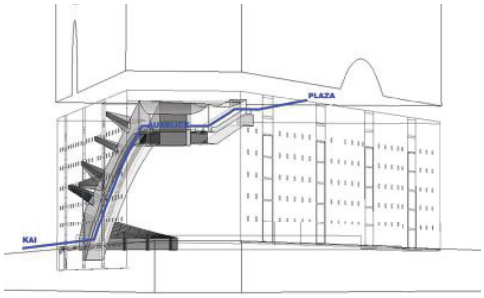
36 General information on the Elbphilharmonie prospect. The link can be found here: http://www.stiftung-elbphilharmonie.de/upload/files/CMSEditor/z_listing__Elbph_Folder_Maerz_2010_E.pdf: (20/05/2016).

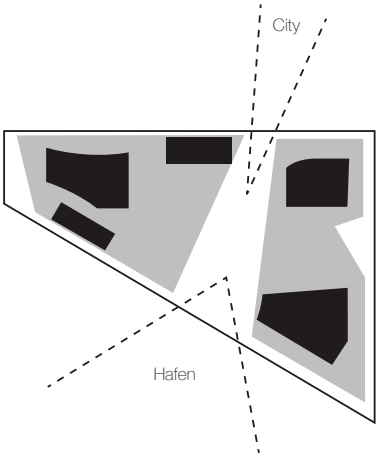
37 The articulation of functions within this building, aside with its scale, announce its exceptional character as a monument. The different programs gravitate around the big concert hall, and yet it remains the fundamental program and function of the building, which is implicit in the name of the building itself.

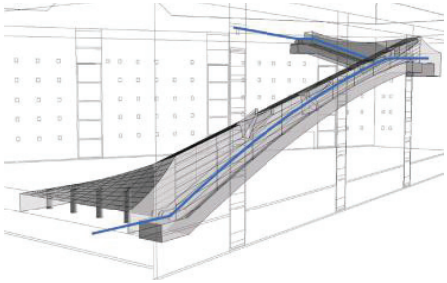
38 See Florian Diekmann, Michael Kröger and Anna Reimann, "Disastrous Public Works Projects - A History of Political Deception in Germany", *Spiegel Online*, 1st of October 2013 : *"New York has the Statue of Liberty, Paris has the Eiffel Tower, and Berlin has the Brandenburg Gate. In Hamburg, the city would like its new symphony hall, the Elbphilharmonie designed by Swiss architects Herzog and de Meuron, to be its most identifiable landmark. The structure, proudly located at the western end of the tony new HafenCity district along the Elbe River, also includes 45 luxury apartments, a parking lot and a five-star hotel. The city hired a consortium under the leadership of German construction giant Hochtief to do the job in 2007. A firm price of €241 million had been agreed to at the time, with the city of Hamburg liable for €142 million. The concert hall was slated to open in 2010, but the building is nowhere near complete today. The construction site sat still for nearly a year as the city, Hochtief and the architects fought over costs, safety concerns and the delays. At the end of 2012, Hochtief and the city agreed to a new price tag: €575 million. It is still unclear how much of that bill taxpayers will end up paying. At the soonest, the city's symphony will take to the stage in its glitzy new home in 2017."*

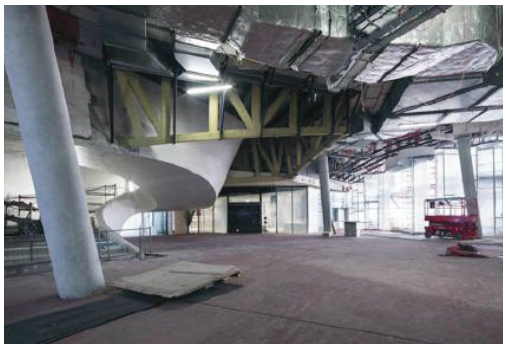
39 Anneke Bokern, « Hamburg: [the Elbe Philharmonic Hall turns out to be over ten times more expensive than originally calculated, leaving Hamburg with high hopes of a Sydney Opera House effect]. », *Mark : another architecture*, n°47, 2013, pp. 76-83; see also Luis Fernández-Galiano, *Arquitectura Viva. Herzog & de Meuron 1978-2007.* , Madrid, 2007; Nobuyuki Yoshida (Ed.): *Architecture and Urbanism. Herzog & de Meuron 2002-2006*. Tokyo, A+U Publishing Co., Ltd., 08. 2006.

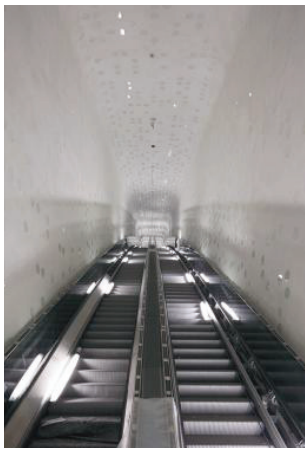
40 To start with, the section - identified before as main tool to enable the comprehension of the hybrid building's inner structure - seems to become insufficient to allow an understanding of the complexity



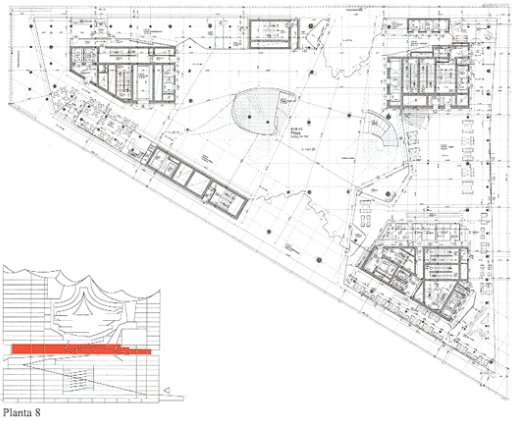








The Escalator



Elbphilharmonie - The public Promenade
The Intermediary viewing platform

Source: © Herzog & de Meuron

The Plaza

Source: © Herzog & de Meuron

depth of the volume – whereas in a tower, it is simpler to assign each floor (or set of floors) to a specific activity - or, in a horizontal building, program can be distributed according to a spatial logic of zoning (as we have seen, for example, at the Vanke Centre) - the Elphilharmonie works rather like a complex body with superposed and interconnected organs on top of a solid and massive base. At the same time, the specific program within not only occupies a substantial part of the nucleus, but it also releases de need for natural light, liberating façades for other programmes. However, the circulation within the building hasn't been planed exactly as a logic of veins - although one would expect the large concert hall and the large public plaza to be the heart linking different circulation branches inside the building. This articulation happens in between the programmes related to the theatre (backstage, production) but are quite limited when it comes to housing or even to the hotel, since these programmes have direct independent accesses from the street.

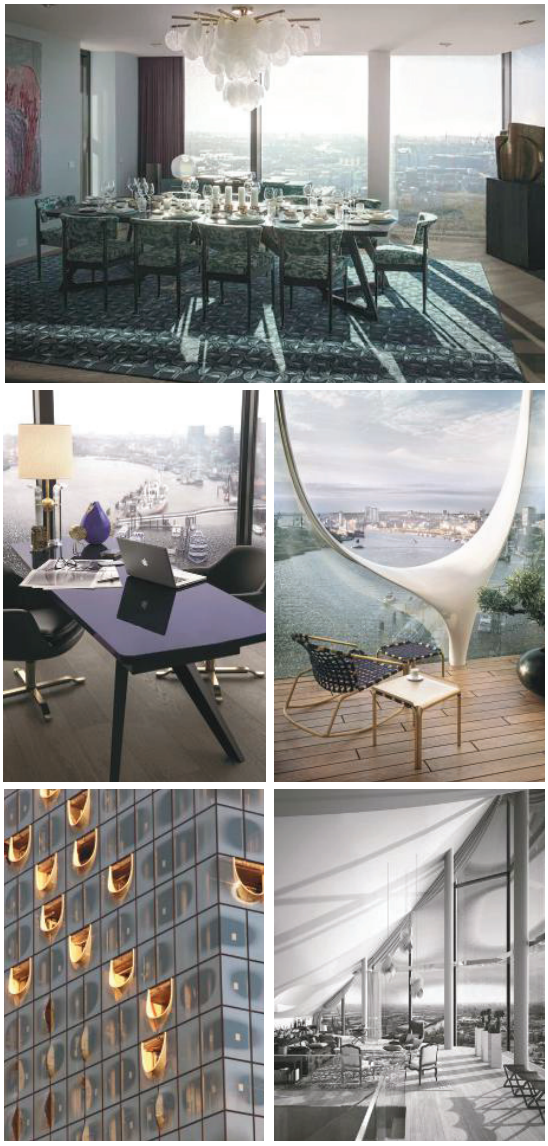
building and city

An exceptional achievement to be observed in this building is the fact that - despite its compaction and monumental character – a significant percentage of public space succeeds at 'perforating' the building and occupies an important spot in height[41]. The access to the building is done via a set of 29 lifts, but most notably via the so called 'tube', an 82 m long escalator running all the way between the entry point at the bottom east edge of the project to the top western edge. This escalator goes up to the sixth floor where a panorama window offers views down the river Elbe towards the harbour and docks. From here, visitors can go on up to the Plaza via another escalator. A viewing platform is situated exactly at this intermediary zone of the old Kaispeicher and the new construction rising above it. The plaza spans an area of approximately 4'400 m^2 - about as large as Hamburg's Town Hall market square - and it has been paved with custom-fired bricks, matching the look of the traditional city plazas. Promenades and concert-goers, citizens of Hamburg and tourists alike will be allowed to meet at the plaza, at a height of 37 metres, and enjoy together the 360° view over the city and the harbour[42]. The Plaza is divided into an outdoor circular promenade – offering panoramic views over the city - and an inner area within glass walls. Two curvy stairways lead up to the concert hall foyers. This inner area allows access to the concert foyers as well as the hotel lobby, a café/bistro and an info-shop. In order to reinforce the 'public' character of the building, the presence of these public circulation paths has been enhanced via the lighting of the foyers and stairways – which are seen through the glass façade

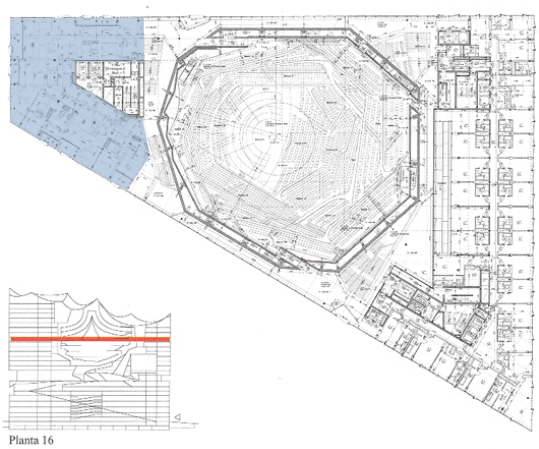
of the system planned inside the Big Building. Program distribution and circulation are done along multi-directional axes and changing inner intensities which, aside with functional superposition, can only be understood through three-dimensional forms of representation.

41 Peter Sealy, "Elbphilharmonie Hamburg", in Vera Grimmer (Eds.) et al. *Oris. Magazine for Architecture and Culture*. Vol. No. 83, Zagreb, Arhitekst, 2013, pp. 12-29.

42 Information package about the Elbphilharmonie; link: https://www.elbphilharmonie.de/media/filer_public/43/86/4386f78b-fd9a-4137-b929-334ad1bf857e/broschuere_elbphilharmonie_hamburg_eng.pdf (20/05/2016).



Source: https://www.elbphilharmonie.de/en/elbphilharmonie



Elbphilharmonie - Apartments
Source: © Herzog & de Meuron

-, luring visitors into the grand concert hall[43]. Although the real outcomes on the functioning of this public space cannot be judged yet, one can guess that security measures of some kind will have to be established and some sort of control of the users will have to be done prior to allowing anyone to enter the tube.

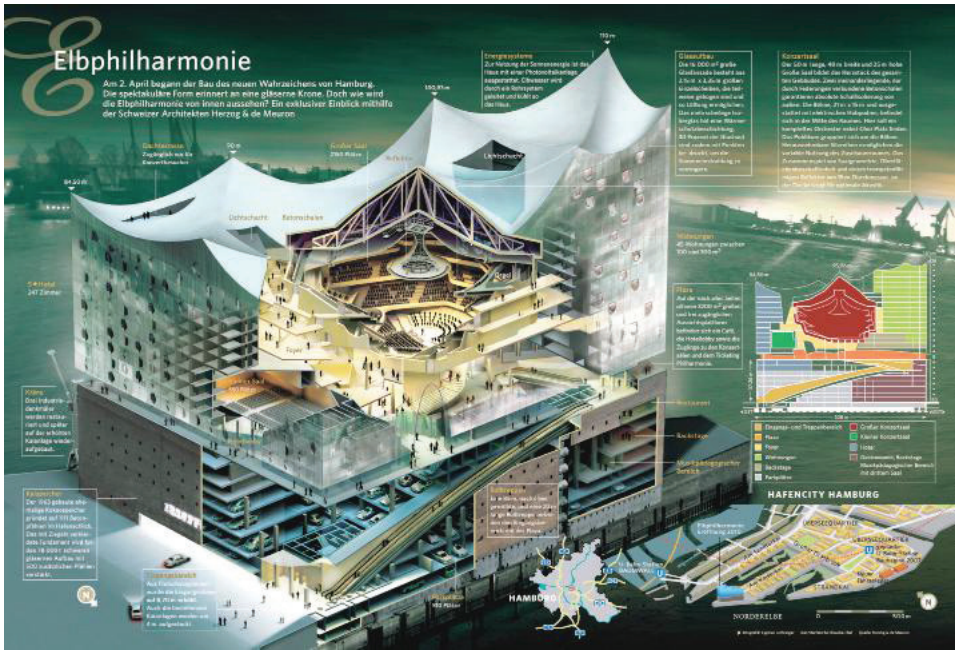
Yet, despite the efforts done in the sense of opening the building to the city, the architectural challenges that are at the base of the conception, - the scale of the building and its program (opera house, luxury hotel and luxury residences) - not only imply that the building will be used by a high social class, but it also turns the building into a monument rather than into a piece of the city, detaching it from the concept of self-contained urbanism and setting it quite close to Koolhaas's theorems – the idea of an auto-monument that has little to do with urban life. Can this idea point somehow at the importance of including public space at the base of the building to actually connect it with the city (regardless if public access is allowed into upper areas or not)? What kind of public space is more effective to resolve the complex connection between the Big Building and the city? How important is that connection to the city and the public users?

housing at the Elbphilharmonie

The Elbphilharmonie, in its typological configuration, would have had the potential to bear a quintessential exploration of the concept of a city within a solid and massive architectural object, with users spanning from one use to the other inside the same building. Its scale and volume bear indeed this in between of what is the scale of a building and the scale of a city fragment. Within this building, it would be possible for an inhabitant to go out of his/her home door, take the lift to the public plaza and watch a concert at the philharmonic hall; possibly meeting friends at the café and finishing with a stroll at the museum before a meeting at the hotel conference room, and finally coming back home (and easily some office/work space could have been added to the scheme).

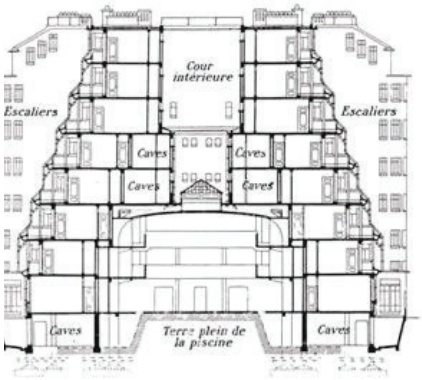
Yet, if we think of it more realistically, we may realize that living at the Elbphilharmonie will, in the end, not be so different from living at any high rise housing building. There is a separate entrance - from the street or from the parking - to the apartment section, with no need for passing through other uses. Adding to that, and considering that the apartments are some of the most expensive in Germany, and its future inhabitants will most likely enter the building by car, take the lift directly to their own apartment, enjoy the luxurious set and view of their home and repeat this daily, which may turn the effort of articulation of uses within the building a bit senseless. At the same time, it is undeniable that such an exceptional building couldn't be realized within affordable prices (and one can always hope that the housing within will evolve with the decades, and eventually become more accessible or more actively linked to the contiguous uses). But the housing typologies found therein are not that incredible, except for the views and the curved glazed balconies [image] that interrupt the interior areas alternately.

43 This information has been extracted from a fact sheet of the project, obtained at the time of a site visit to the building, in February 2015.

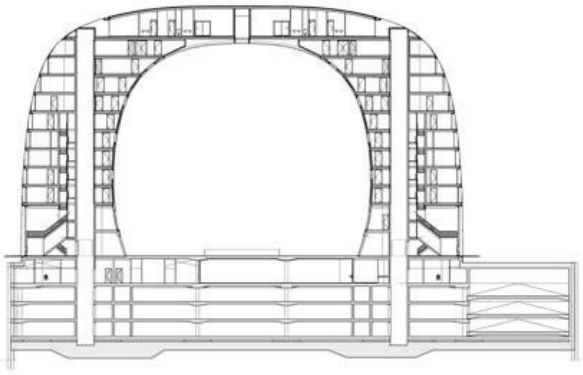


Elbphilharmonie, Herzog & de Meuron (2007-2016): perspective illustrating the spatial complexity and the functional superposition of uses within the building.

Source: information flyer acquired at the time of a site visit to Hamburg in February 2015.



Group of Low-Cost Housing Projects for the city of Paris, 13 Rue des Animaux, Paris. Henry Sauvage, 1922



MVRDV Market Hall

Other than that, and the space the generous areas, the buildings bear standard one-floor types with only one glazed façade (the inner one being obscure); the penthouses are bit more spectacular, as their have the negative shape of the auditorium and a two-floor height [image].

The Elbphilharmonie could be one of the clearer examples to illustrate the concept of Big Building – a city-life logic planned within a massive container. Indeed, it deals with the depth and the massiveness of a sharp volumetric volume in an efficient way - with the program not needing natural lighting occupying the massive nucleus on the top levels, and parking filling the dark areas at the bottom volume. However, it is the nature of its programmes and the lack of a real articulation strategy between uses that causes the scheme to be not so exceptional in terms of its daily use (since the different programs can be reached almost directly – without real need to pass through intermediary/social areas).

We could say that the housing experience will eventually result on a scheme that, in terms of conciliation of uses (without real articulation) could be comparable to the one seen at the Low-Cost Housing Project for the city of Paris Rue des Animaux, by Henry Sauvage, 1922 – in which the apartment units wrap the nucleus occupied by a public swimming pool [image]; there's not relation (visual or spatial articulation between the two programmes), and it bears even less articulation than the recent MVRDV project Market Hall (2014, Rotterdam), where the apartments wrap the nucleus of the market hall, bearing visual connection with the program (houses and market), although it results on rather strange apartment typologies – very deep – and also strange visual frames quite present inside the homes without increase of light; for instance in some typologies, there are bedrooms with window towards the central market that become rather dark spaces with a rather strange view [image].

2.2.7. Between Urban Diversity and Functional Mix Concluding notes

Throughout this chapter we have observed that, although the majority of human assemblies in the history of mankind have settled around mixed patterns, the zoning laws that have been implemented to the cities after the industrialisation, the advent of the skyscraper and the principles of order proclaimed by the modern urbanism led to the segregation of functions in the city into different zones of housing, offices, manufacturing, etc. Yet, after the 1960s, the advantages of the mixed-use zoning started to become evident, triggering the amendment of the zoning regulations and inciting the planning not only of mixed use urbanism but also mixed use buildings. The recognized advantages were, amidst other:

- an increased and more efficiently distributed variety of uses in the cities;
- shorter distances between home and work - and thus less wasted time in daily commute;
- the control of the urban sprawl;
- stronger and more pleasant neighbourhoods;

more pedestrian environments and spaces for encounter.
Despite its recent popularity in terms of urban strategy, the mixed-use building has always been present in the cities. Its quintessential model – the house above the shop – is central as it helps us understanding, on the one hand, the key importance of the uses that are located at the ground level for the definition of the urban life in the city and, on the other hand, the challenging design exercise implicit in the articulation of housing with other functions within the same container (observed already in the simplest model). However, several other mixed use schemes, increasingly larger and more intricate, and often linked to important transportation hubs, have emerged in the beginning of the twentieth century and became precedents for larger and more complex forms of mixed use buildings that ultimately evolved towards the Big Building we know today.

Analysing mixed functions in the series of examples presented above – historical and recent - allowed us to understand:

a) **the way different programs can be arranged within a single building;**

From the seminal models of mixed use – articulating housing and retail – many buildings have lodged either classic or unfamiliar associations of uses. The most recurrent uses to be mixed with housing are offices, retail/activities, often also hotels and car park, but some recent projects bear the most unlikely combinations – like a large philharmonic hall planned aside housing units, within a unitary and undifferentiated mass.

Most of these buildings have programs organized according to a vertical gradient of privacy: the lower floors - linked to the street and articulating the building with the city - contain retail, restaurants, or activities; offices are placed above these, and housing, at the upper levels, benefits from the privacy, the silence, the light and the clear views. Some buildings, like the John Hancock centre, bear a tapered volume,

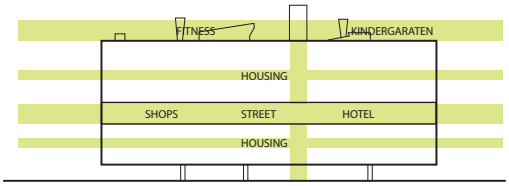
The quintessential mixed use building:
Housing above the Shop

- The primordial form of functional hybridity
- The importance of commercial activities at ground level on the definition of the urban network
- The simplest form of mix containing housing
- The first living&working model
- The fundamental issues on the articulation of housing and activities: articulation with city, publicity vs. privacy, living&working

The Quintessential Big Building
The *Unité d'Habitation*

- Set in a context of low urban density
- A building in a park
- Disconnected from the ground
- Commercial Street elevated, inside the building
- Associated functions of living, education and commerce

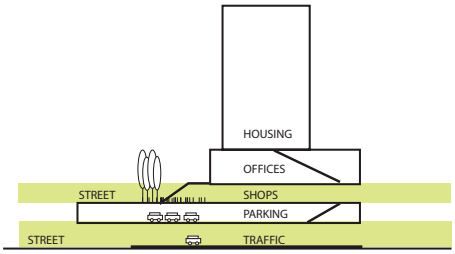
Buildings:
Unité d'Habitation, Le Corbusier, Marseille, 1952



The vertical stacking of functions and urban features:
The vertical urbanism

- Automobile circulation at the ground level
- Car parking at the ground level and first floor
- An exterior platform for shops and public at the roof of the first floor
- Offices occupying the two or three levels above
- Housing at the higher buildings (towers)

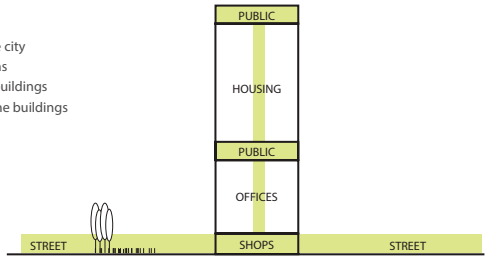
Buildings:
Front de Seine, Raymond Lopez, Henry Pottier & Michel Proux, Paris, 1959
Olympiades, Michel Holley, Paris, 1969
The Barbican Centre, Chamberlin, Powell & Bon, London, 1969-82



The vertical stacking of functions:
The American Hybrid

- The American Hybrid = vertical stacking of functions, vertical growth of the city
- Limited examples with housing due to the application of zoning regulations
- The few hybrids containing housing illustrate the topic of living&working buildings
- Commercial and leisure activities keep being predominant at the base of the buildings

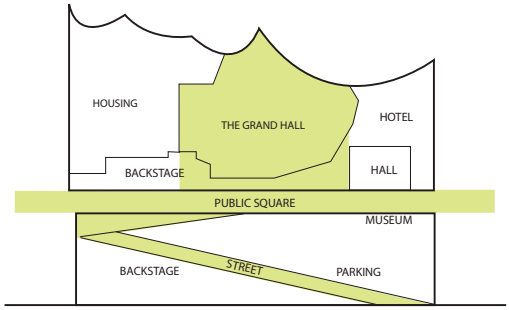
Buildings:
The One Hundred Storey Building, Theodore Starrett, 1906
The Marina City, Bertrand Goldberg, Chicago, 1964
The John Hancock Center, S.O.M., Chicago, 1968
The Olympic Tower, S.O.M., New York, 1976



A city within a container
The Big Building

- A city within a building
- Interwoven uses, multidirectional circulation logics
- Disconnection from the city fabric
- Recreation of urban areas within the building

Buildings:
The Elbphilharmonie, Herzog & de Meuron, Hamburg
Dubai Renaissance, OMA, Dubai, 2006 (unbuilt)
111 First Street, OMA, Jersey City, USA, 2006 (unbuilt)
Linked Hybrid, Steven Holl, Beijing, 2003-2009
Vanke Centre, Steven Holl, Shenzen, 2006-2009



reducing their footprint to adapt to the size of the apartments (although one cannot distinguish programs from the outside). Some other buildings, organized both horizontally and vertically, like the Barbican or the Linked Hybrid, place housing in towers rising from the common podium where social and cultural activity takes place.

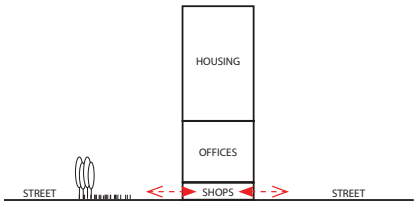
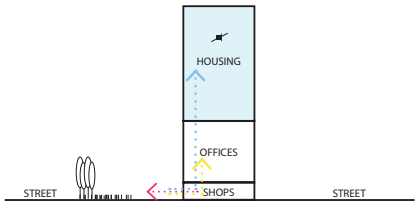
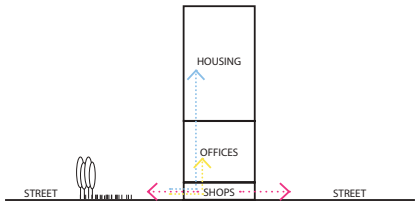
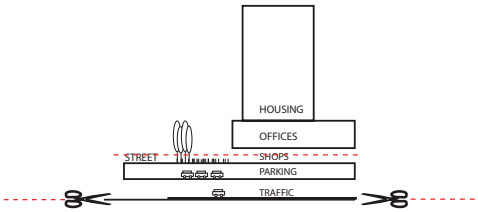
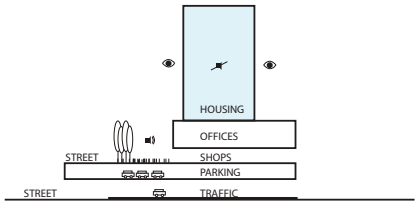
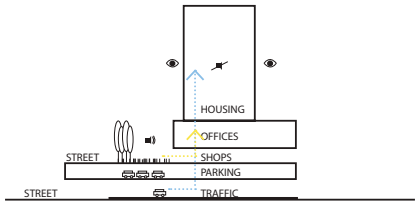
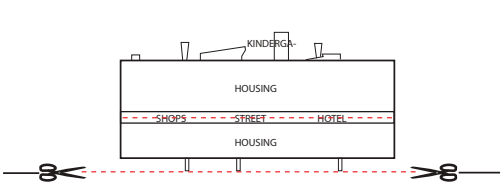
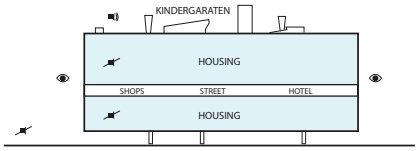
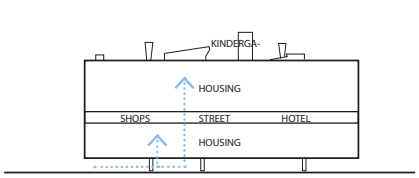
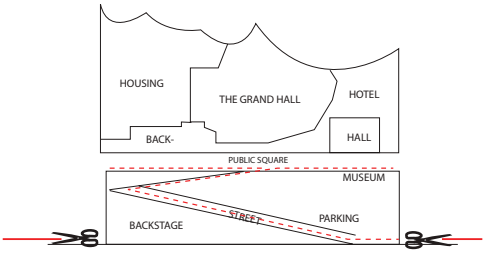
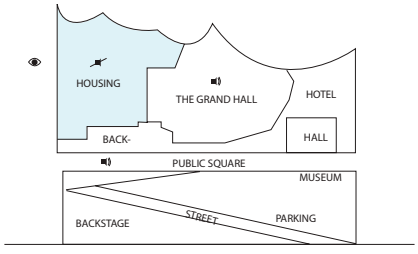
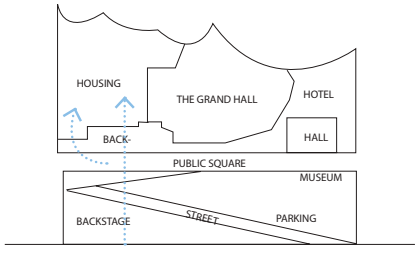
Le Corbusier has been the first to prove that this typical gradient organisation could be planed with more inventiveness, opening way for creativity within mixed-use schemes. Instead of reinforcing the bound with the city – since the building was planned for a rather non-densified zone - Le Corbusier eliminated all programs from the base, liberating the ground and placing the commercial street at a middle height and communal programs at the roof. Another building eliminating the program from the base (though locating some cultural program underground) is the Vanke center, experimenting the reverse of the typical vertical gradient this time along a horizontal axis that links housing, hotel and offices.

Within this principle of mix, programs can establish more or less intense interactions with one another, bearing either a real articulation of uses or a mere coexistence/ juxtaposition of uses. Whereas in the American type (The John Hancock Center or the Olympic Tower) one can access any floor of the building directly from the street via elevator - often without getting to understand what kind of spaces or uses are located in the between – in the examples of vertical urbanism (The Barbican, Front de Seine, Olympiades), the user is forced to walk through the different levels and uses of the complex prior to reaching a specific location. In any case, the idea that one can live and work within the same building comes in as a strong statement.

We have also seen that public programs are difficult to be planned at higher levels of the building. Although most of the projects of mixed-use buildings depart from the intention of having public plazas or other facilities located on top levels, in many cases the idea is left behind due to security reasons and also costs/maintenance issues. Although this feature is common in the American examples - the John Hancock Center, for instance, holds a public observatory on the 94th floor – it might succeed here due to the existence of a core that serves only public, protecting the privacy and security of the inhabitants. Nonetheless, at the Elbphilarmonie, the idea if building a real public plaza within the building has been taken forward - there's even a public 'street' (a long escalator) inviting the public to reach the public plaza above the warehouse - but we cannot yet comment on its real outcomes.

b) **the relation that different programs may establish with housing;**

We have seen that the 'house above the shop' is the simplest and yet one of the most comprehensible examples of correlation between shop and housing, due to the strong bounds that it establishes simultaneously with the street (the public) and the person living at the upper floor (and often working at the lower floor). While the idea becomes more diffuse in larger buildings, it is still possible to find built complexes that are simultaneously a person's home address and workplace – the seminal idea of living and working within a building behind the American Hybrids (as seen above in the 100 story building), which was disrupted during some decades due to the zoning laws, and

ARTICULATION WITH THE URBAN FABRIC	HOUSING & MIXED USES PUBLICITY VS. PRIVACY	ARTICULATION BETWEEN DIFFERENT USES
		
		
		
		
		
		

Author Diagrams

The Big Building - Housing and Complex Design Strategies

re-explored later in buildings like the Marina City or the John Hancock Center. But beyond the obvious advantages that this may represent, in terms of the short distances between the different programs, the simple circumstance of living within an animated working, social, commercial or cultural environment might have a direct impact on the lifestyle of the inhabitants.

In most of the examples analysed above, we have seen that the variety of programs in proximity with housing provide a pleasant 'urban feeling' to the living environment, and yet it is absolutely fundamental to ensure that the housing areas still have enough privacy, security and silence. Although in most cases it would be possible to live, work, go to the restaurant or shopping within the same building, we have also noticed that this does not seem to the key-priority for the conception of these buildings (one could perfectly work there without living there and vice versa).

We have stated that, possibly more than providing homes for different social standards, it is important to provide common areas and social/cultural programs where people can actually get acquainted and influence one another. This has possibly been one of the reasons behind the success of the Barbican throughout the years – the fact that people gather to feel intellectually stimulated within the same built environment. A very similar strategy seems to be the one applied by Steven Holl to the Linked Hybrid – with its thoroughly designed landscape (common courtyard) on the rooftop of the building's commercial area and the cultural passerelle linking the residential cut-edge towers at a higher level of the building. Simultaneously, these two buildings located in highly densified areas remain close to the cities, link to the cities, but create a small urban environment of their own.

We have also understood than the visual presence of the ensemble, while being peacefully at home, might be a comforting and also stimulating feature for the inhabitants. Whereas, while living in a skyscraper, one sees only the big city, not having a perception of the building on its own, living in a building which is developed both vertically and horizontally provides the inhabitants with a comforting feeling of integration.

c) **the connecting/articulation strategies (vertical vs. horizontal);**

We have seen above that different circulation axes result on very different social logics within the building. Whereas the pure vertical circulation allows for shortcuts between street and floors, leading to a schism between different parts of the building; one can reach an upper level without necessarily understanding the program hosted in the in-between levels or meeting other users. On the other hand, buildings that are structured along horizontal paths end up functioning in a logic that is much closer to the traditional street – having the perception of the different buildings and programs. At the Barbican or at the Linked Hybrid, for instance, one is invited to walk trough the commercial/cultural area to reach the apartments. A similar strategy is used at the Elbphilarmonie – there's an intermediary public square distributing to the different programs above (although, in both cases, one still has the chance to reach the dwelling from the street).

Le Corbusier, having promptly recognized the great potentials of the densification and functional mix in height, but he was the first to refer to the importance of horizontal circulation axes, which he ultimately added to the design of the Unité d'Habitation, whose features have inspired many other schemes throughout the decades that followed, and several buildings reproduced the 'street in the air' concept.

d) **the articulation with the ground**

We have understood the importance assumed by the program that is placed at the ground level on the articulation building and city. We have also seen that two strategies are possible: the first examples – 'house above the shop' and, the American Hybrid or the examples of Vertical Urbanism seem to function in a close relation and interdependence with the city fabric; oppositely, the Unité d'Habitation or the Vanke Centre, follow a strategy that is rather one of disconnection – and hence the building becomes an organism functioning on its own, according to its own internal logics.

The truth is that both strategies may be valid for the Big Building: it is either possible to link the building to the city fabric by establishing an inner 'urban' space (often elevated from the city fabric to assume a new category), or, on the other hand, it is also possible to detach the building from the city completely, providing most of the services needed by the inhabitants within walls. This was the concept of the One Hundred Story Building, which seems to be reinterpreted by OMA on the project Dubai Renaissance, aiming for the development of a vertical urban system (with clear vertical and horizontal axes) to create a model of self-contained city where inhabitants can remain during the entire day. Even the Marina City, that seems to be quite open to the city, seems to have been thought as an complex to provide all facilities to the inhabitants: "*The theatre, the restaurants, the offices, the parking, the retail, the recreational, the boating and of course, the apartments – all were bound up and depended upon each other for a successful living cheek by jowl.*"[1]

The example of the project Linked Hybrid – one of the most recent projects in this chapter – is particularly interesting for it seems to be an example of Big Building (with all its intrinsic complexity) that has a very clever treatment of the landscape at the ground level, allowing for an articulation with the extant city, while nonetheless providing a diversity of programs that enables the self-sufficiency of the building. The building is also exemplary for the clever strategy it implies on the articulation of vertical and horizontal circulation axes. It is possible to bypass the complex to reach home directly, while it is still possible to walk through the complex, meet the neighbour, have coffee (like in a real urban environment) and, only then, to reach home.

In that sense, one of our main conclusions is that the repeated statement proclaimed by Koolhaas – the one of and inevitable disconnection between Big Building and city – shall possibly not be taken for granted. Despite the 'global'/generic aspect

1 Igor Marjanovic and Katerina Ruedi Ray's, *Marina City: Bertrand Goldberg's urban vision*, *op. cit.,* p. 43.

that these buildings might have due mainly to their scale, and despite the challenges that such enormous scale may represent in the planning of such buildings and their articulation with the urban ground, the relation with the city cannot be disregarded. At the same time, and unlike what Koolhaas claims, it might still be important to consider the context for each specific example of Big Building. Indeed, implementing a Big Building in central Paris has surely a stronger impact in the city than placing it in New York or Hong Kong where most of the buildings have large dimensions, and possibly here, without the constraint of the grid, the base can be explored as a transition ground. At the same time, the idea that the Big Building implies giving up any 'social' strategies might indeed be questionable, as the different buildings we have analysed illustrate diverse potentials in terms of the rearrangements of form and function, and are not necessarily linked to a concept of luxury (although they rarely have a strong social character or social statement).

Overall, it is key to bear in mind the spatial complexity of Big Buildings, true vertical cities that condense, into emblematic/monumental points, the density and activity of traditional urban conglomerates, transforming the character of city areas, their ways of being used and perceived, and having an expansive effect on the neighbouring areas, triggering the transformation of a highly complex territory.

03

Density, Typological and Social Mix

Density, Typological and Social Mix

3. Density, Typological and Social mix

3.1. Introduction

Coming back to one of the base hypotheses of our research - the one that envisages the Big Building as a hybrid between architecture and urbanism, and thus as an embodiment of a new form of architectural/urban complexity within a building -, it would be reasonable to expect multiple forms of mix to proliferate and correlate within this large-scale container; not only in terms of functional mix, but also in regards to social mix. In order to allow for social mix to proliferate, the treatment of the housing areas would have to be thought-through with particular architectural attention, providing sufficient variety of dwellings (in terms of sizes, finishes, typologies) and appropriate intermediary spaces (internal streets, squares, playgrounds, activities, etc.) and services, in order to suit multiple different user types and to motivate them to cohabit within a thrilling diversified environment (we will discover some of those architectural principles in the next pages).

Yet, as we have mentioned in the previous pages, although the historical and recent examples that have been analysed represent pertinent forms of mix within large architectural containers, often bearing a substantial percentage of housing, in most cases, there's no particular focus on the planning of housing nor on the development of innovative models of living – exceptions made for the Barbican Centre or the *Unité d'Habitation*.

We have indeed found within the model of the *Unité d'Habitation* most of the base qualities that we were expecting to find in a Big Building, as a paradigm of transposition of the classical city functions (once targeted by Haussmann) into a complex, dense and compact architectural object. Yet, when it comes to the typological mix in housing, although it is declaredly targeted and ingeniously planned in this building, we have seen that it reduces social mix to a simplistic range of family-types that followed the standards of the modernist idealism.

Nonetheless, the base social impetus was there as a seed and, as we will see, several architects through times and in several different projects, have ambitioned to explore the *Unité d'Habitation's* fundamental potential for social mix, by increasing its typological housing mix and thus adapting the dwelling offer to today's heterogeneous and changeable society.

As the majority of the previous examples of Big Buildings that we have analysed did not allow us to illustrate the complete list of potentials of a typological mix of housing, we had to open our range of case studies that would be focused on typological experimentation and we have indeed found some interesting examples that, despite most of the times being significantly under the Big Building's threshold scale that we have defined initially (sometimes less than half), These buildings are predominantly housing buildings, despite providing small percentages of other uses: retal, cafés, public spaces, etc. may help us to find interesting architectural strategies to feed our collection of guidelines for the planning of innovative and good housing schemes within the Big Building.

We will also see that, for most of these examples we will be exploring in the next pages, Le Corbusier's *Unité d'Habitation* has been an assumed reference, that the authors like to enhance.

3.2. Typological Mix and the current architectural conception

> "*Un immeuble peut accueillir des populations différentes par âge, le niveau social et/ou économique, le statut social, la situation matrimoniale. Si les bâtiments cités peuvent abriter, à l'occasion, des commerces ou des bureaux, il s'agira ici plutôt de discuter de la mixité ou du mélange social dans l'habitat ainsi que des effets de l'organisation de l'espace dans l'immeuble d'habitation sur ce phénomène.*" Monique Eleb & Jean-Louis Violeau, 2008

Throughout the latest decades, many lines have been written on the topic of social mix within collective housing buildings. Some recurrent questions have been at the base of these studies, most of the times establishing a direct link between architectural conception and social mix. Is it enough to bring people together to make a group? Is it enough to play with different sizes, typologies and finishes of dwellings to stimulate social mix? Is it really possible to recreate and stimulate different modes of living through architecture? Shall differences amidst the different types be enhanced, or rather diffused?[1]

Extrapolating the domain of architectural theory, the concept of 'mix' has also been object of several sociological studies throughout the latest decades. Among this series of studies, some scrutinize the relations of co-presence within the same building[2]. Others observe the social interactions happening within "articulation spaces"[3]. Other works focus on the study of larger residential complexes: old central city blocks, suburban *grands ensembles*, etc. It is indeed important to state that the phenomena and processes observed may be different when observed in different scales of building and city: "*dans le cas d'un quartier où la "vie de quartier" des habitants est peu développée, mais qui abrite des immeubles à l'intérieur desquels les individus entriennent de fortes relations de voisignage*".[4]

1 These questions are enhanced by Jean-Yves Authier in the chapter "Les pratiques sociales de corpulence dans les espaces résidentiels: mixité et proximité", in Diversité sociale ségrégation urbaine mixité, PUCA, Lyon, 2008, p. 103: "*L'examen des pratiques sociales de co-présence dans les espaces résidentiels permet d'appréhender la question de la mixité sociale dans ses rapports avec la question de la proximité spatiale. Comment les citadins cohabitent-ils dans les espaces situés à proximité de leur domicile? Quels types de rapports sociaux se construisent entre les habitants dans les quartiers socialement hétérogènes? Comment les différences et les formes de coexistence se structurent-elles localement? Ces questions ont fait l'objet de très nombreux travaux sociologiques.*".

2 Elisabeth Pasquier-Merlet, *Bonjour-bonsoir? : La gestion publique des espaces privés dans les HLM de Nantes,* Thèse de doctorat, Nantes, 1993.

3 See for instance: Christian Moley, *Figures architecturales de l'habitation*, ed. Ville Recherches Diffusion, Nantes, 1990; Nicole Eleb-Harlé, Anne Vauvray, Roselyne Villanova, *Quand la rénovation se pare d'îlots, Saint-Denis, espaces intermédiaires et centralité*, PCA, Paris, 1993.

4 Elisabeth Pasquier-Merlet, *Bonjour-bonsoir? : La gestion publique des espaces privés dans les HLM*

A particularly interesting and nurturing work to our research - despite its small scale - is the one that has been led by Monique Eleb and Jean-Louis Violeau at a housing building called *La Maison Radu,* in Saint-Nazaire, France[5]. "*L'idée consistait en somme à faire cohabiter des populations diverses en proposant des dispositifs spatiaux censés faciliter la vie communautaire (café et celliers au coeur de l'immeuble). Bref, un immeuble équipé, dont la forme traduisait l'idée de l'ouverture et de transparence, et habité aussi bien par des ouvriers, des RMIstes, que par des maîtres de conférence.*"[6]

The aim of this study was to verify up whether spatial proximity could somehow translate into social proximity: "*Ce qui nous était proposé là, dans le discours et dans les textes du promoteur, n'était rien d'autre que de tenter de nous faire penser, a priori, que la proximité spatiale annulerait, de fait, la distance sociale ou tout du moins suffirait à créer une convivialité de groupe entre des personnes qui n'étaient pas censées cohabiter. Bien sûr, derrière cette opération, se profilait l'idée de cohésion sociale et c'est ce qui a motivé pour une part notre choix de travailler sur cet immeuble. En fait, c'est bien la croyance que par le rapprochement spatial on pouvait réellement créer une communauté sociale qui était à l'œuvre ici. C'était avoir comme postulat que l'architecture avait un effet social* »[7].

The building was equipped with some particular spaces that were meant to trigger intimacy, such as the position of some private terraces - contiguous in some points. Other services, like a café at the middle of the building, intended to stimulate the feelings of social interaction and neighborhood, accentuating the fundamental aim for 'forced conviviality'.

In parallel with this idea of mixed uses at a small scale, the base idea was to bring together different financing models regrouped by floor, proposing spatial devices able to stimulate social interactions. "*La mixité se decompose ainsi à travers des strates verticales allant non pas, à l'image d'une tradition "malheureuse", du plus pauvre au plus riche, mais à travers une distribution alternée: deux étages de PLA (Prêt Locatif Aidé), les bénéficiaires du PLAts (Prêt Locatif Aidé Très Social) au coeur de l'immeuble, à proximité des services, et les PLI (Prêt Locatif Intermédiaire) aux niveaux supérieurs*"[8].

Another interesting goal behind this building is one that is very familiar to architects since the very early examples of collective buildings: lending to the collective building the qualities that can be found in individual villas. The particularity, in this case, was that the focus was less on the interior features of the dwellings and more on the exterior elements like the entry door, the garden, the fences, seeking the recreation of some sort of vertical allotment.[9]

de Nantes, op. cit., p. 104.

5 Monique Eleb, Jean-Louis Violeau, « Dispositifs architecturaux at mixité sociale », in *Diversité sociale ségrégation urbaine mixité*, PUCA, Lyon, 2008.

6 Monique Eleb, Jean-Louis Violeau, *Diversité sociale ségrégation urbaine mixité, op. cit.,* p. 94.

7 Monique Eleb & Jean-Louis Violeau, *Entre voisins : dispositif architectural et mixité sociale*, Les Editions de l'Epure, Paris, 2000, p.9.

8 Monique Eleb, Jean-Louis Violeau, *Diversité sociale ségrégation urbaine mixité, op. cit.,* p. 95.

9 *Ibidem,* p. 95.

Maison Radu
Photos: Radu Vincenz

Maison Radu
Photo: Jean-Louis Violeau

This study shows somehow that 'intimacy' is a strong structuring concept for our society, even if architects tend to have difficulties in acknowledging it. No form of social mix could ever be established without a wise protection of intimacy, and therefore the treatment of the interior space and its relation with the common facilities must be settled thoroughly[10].

In the observations of this sociological study, one can nonetheless state that the configuration of some architectural elements like the terraces – the configuration, orientation, position, size and intimacy - helped somehow differentiating the inhabitants and establishing a certain hierarchy defined by the position each one occupies within the building.

Although one might tend to think, at first, that mix may represent a certain 'annulation of differences', the authors of the study underline that this has never been their aim. Indeed, it is stated that the comparison with others may trigger new aims and aspirations on the inhabitants that may contribute to their own social perception and development: "*La comparaison, le classement social, la possibilité de changer de classe sont perçus dans nos sociétés, comme un but et comme une aspiration positive. (…) Le mélange permet de se mesurer aux autres et si c'est quelquefois douloureux, le plus souvent cela permet de comprendre son parcours, de donner forme à ses aspirations, d'espérer parfois une ascension positive pour ses enfants, par le contact avec des membres plus privilégiés.*"[11]

Despite the numerous constraints and difficulties observed in this study, aside with the questioning that can be raised around the query of 'mix' - whether the architectural mix can eventually translate into a real form of social mix - the authors seem to unveil some hopeful observations to the study done at "Maison Radu", stating that, for the case of this building, spatial proximity has, in some specific moments, translated into some sort of social blending: "*le 'nous' employé par de nombreux locataires indique à la fois la bonne entente et le désir de proximité des niveaux, des valeurs, qui entraîne le plaisir et le confort de se sentir entre soi*"[12].

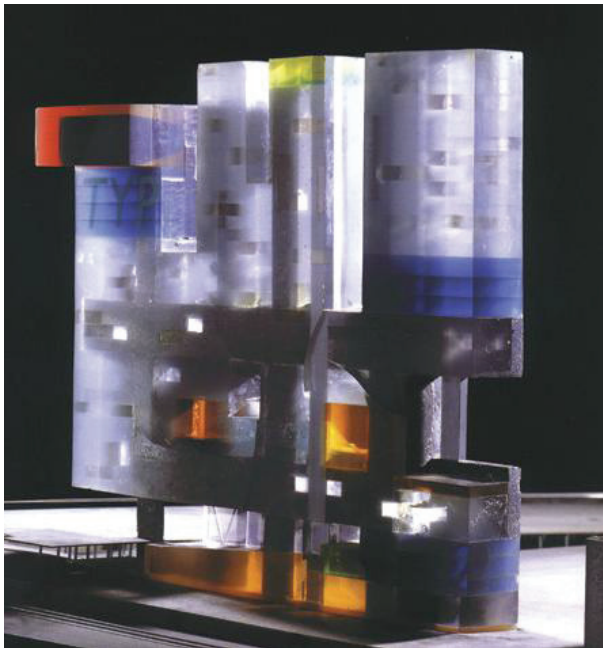
The borders are blurred between the disciplines of architecture and sociology in what relates to the subjects of mix and diversity, for both constantly interact with one another, and ultimately question/refute one another. Yet, the base question that remains intriguing and influencing contemporary architects and sociologists is nearly identical and can be summarized in the words of the French architect Françoise Helène Jourda: "*Une véritable mixité des typologies de logement correspondant à des modes de vie différents et pas seulement à des quotients familiaux, permettrait-elle de créer un « engrenage » de mixité sociale ?*"[13]

10 *Ibidem,* p. 97.

11 *Ibidem,* p. 100.

12 *Ibidem,* p. 99.

13 *F*rançoise-Hélène Jourda, «Diversifier l'habitat pour rapprocher différents modes de vie, op. cit., p.17.



MVRDV, project ***Berlin Voids***, 1991
Source: courtesy of MVRDV

3.3. Mix and diversity explored in the work of contemporary architects

A fundamental questioning concerning typological mix and social mix - whether the design of a complex typological mix can not only respond to a growing social heterogeneity but also trigger social interaction - represents one of the key research subjects on the work of many contemporary architects, and, in particular, the one of the Dutch architects MVRDV.

We will henceforth focus in a selection of buildings designed by MVRDV, not only because they follow this recent trend of housing mix pertaining to the contemporary Dutch housing production, but also because their projects seem to experiment with several reinterpretations of the principles developed by Le Corbusier at the *Unité d'Habitation* – the crystalline, single, freestanding building type containing a mix of uses and an interesting range of housing schemes. As we will see, housing quality, typological diversity and density are indeed guiding precepts of their work since the early beginning of their activity as architects[14].

Berlin Voids

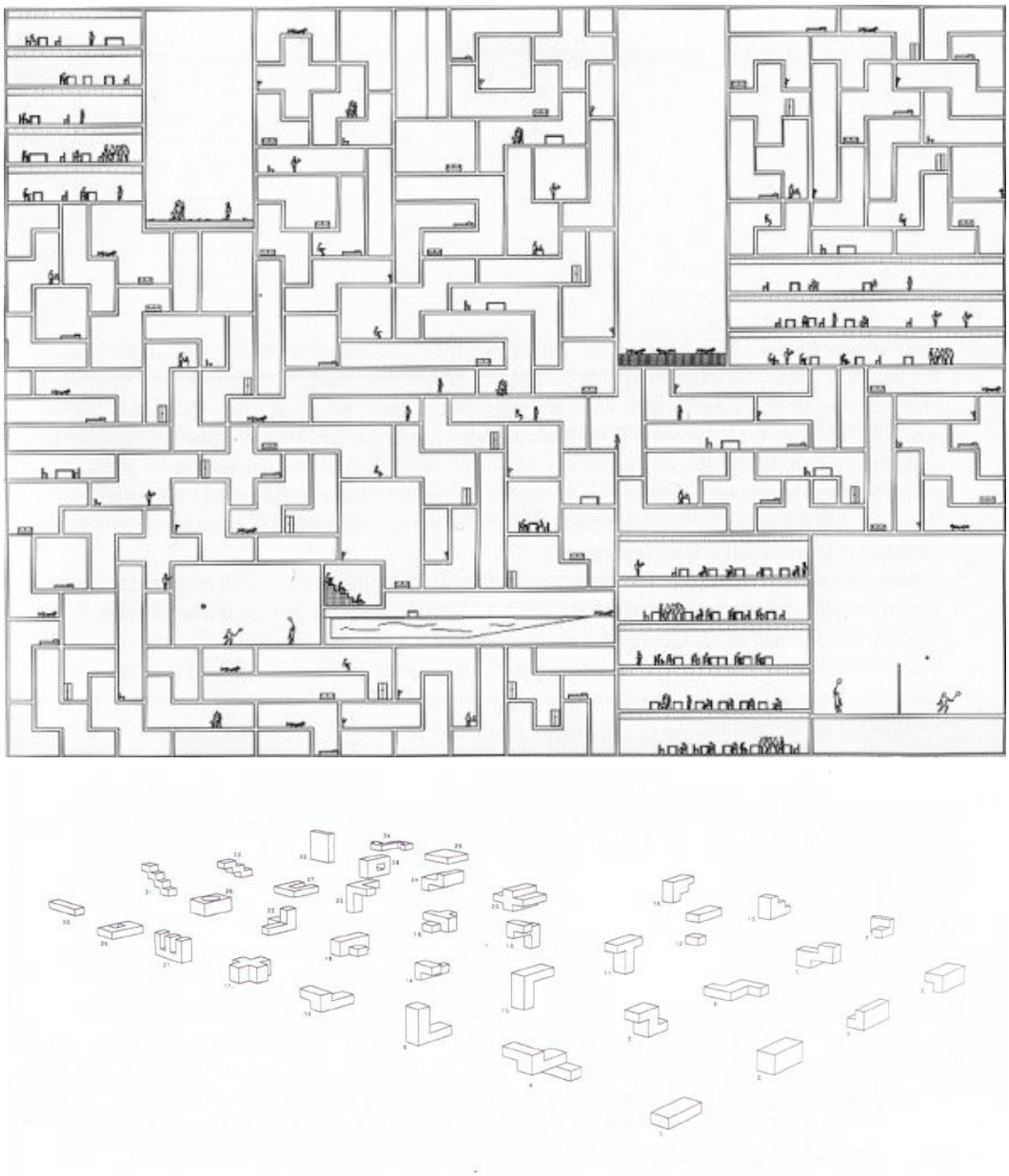
MVRDV, 1991 (project)

A housing project for Berlin, bearing an extreme housing mix, has indeed punctuated the early start of MVRDV's practice with the project *Berlin Voids*, a competition entry for the Europan in 1991. The competition proposed the intense densification of a city block in Berlin. Yet, instead of developing a horizontal model, as what would be expected for that site, MVRDV have adopted a completely different strategy[15]: they developed a building with 27 floors with a complex morphological configuration and an intricate articulation of dwelling units with different shapes, sizes and internal layouts - all merged together and yet revealing the complexity of the components, almost like in a Tetris, in which "*284 'ideals' are shown to the east and west (of Berlin) in a frozen composition of well-known and newly discovered dwelling types.*"[16]

14 See, on the subject, *MVRDV, Far Max – Excursions on Density*, 010 Publishers, Rotterdam, 1998. p. 561: *"Given the increase in the number of times we move house these days (from 2.2 times per person per lifetime in 1950 to 7.8 in 1994), the feeling that a house is a temporary place to stay in increases with it. The house has become part of our 'dwelling-career' with the longing - for diversity seemingly paramount: everyone should have lived in a loft at one time, in a house on the lake, in a squat, a bungalow, a commune, alone, with kids… The demand for a greater variety and even more extreme dwelling forms is gaining momentum. The ideal home doesn't exist anymore, there are thousands of ideal homes. The permanent ideal has been supplanted by the temporary.".*

15 See A+u n° 11, 2002, MVRDV *F*ILES, Projects 022-209, p. 10: "S*hould the former envelope be respected, so that East Berlin continues to withdraw into the world of inhuman tenement blocks (Mietskasernen)? Or should the building stand proudly, encouraging literal connections between these Mietskasernen and other 'Grosshaüser' on the horizon, so that Berlin can enjoy the large-scale cohesion worthy of a capital city? A 'titled' Mietskasernen could be erected to satisfy these aspirations, while at the same time performing public functions. It could then display its contents to the outer world as a vertical neighborhood packed with 'ideals'*".

16 MVRDV, *Farmax, Excursions on density*, *op. cit.,* p. 561.



MVRDV, project ***Berlin Voids***, 1991
Source: courtesy of MVRDV

These 'ideal homes' recall Le Corbusier's typologies at the *Unité d'Habitation* - named according to their specific features: "the home with no walls", "the house without roof", "the house with two floors", "the house with the big window", etc[17]. Indeed, this project is almost like an exacerbation of the imbricated dwelling typologies explored in the past by Le Corbusier, offering a much broader variety of apartment units. And also like in Le Corbusier's projects, the apartments were articulated with communal services like fitness, sauna, primary school and other – and these were, on their turn, connected to other commercial functions through a series of suspended public spaces. "*Dans ce projet de jeunesse, l'attitude des architectes renoue avec un esprit de valorisation des modèles de haut gabarit. Mais contrairement aux tours du second après-guerre, le nouveau superblock est mixte et agrémenté d'une vision poétique et ludique d'un acte d'habiter perçu plutôt à travers un prisme d'idéalité et situé, par conséquent, aux antipodes du fonctionnalisme et de la quantification habituelle des programmes.*"[18]

There is indeed a fundamental difference between the typological mix in the projects of these architects and the designs of Le Corbusier: dwellings are no longer conceived for the 'ideal man' or the normal family type with a couple and two children, but rather for a heterogeneous and unpredictable society: *"the idealism of a former generation is confronted with new demands for individualism, protection and differentiation*"[19]

At the same time, this seminal project inaugurates the discussion on other topics that, as we have seen above, are crucial on the discussion around the subject of collective housing buildings: the idea of collectiveness, privacy vs. publicity that are triggered mainly by the in-between spaces, the public/semi public spaces integrated in the volume[20]: "*The housing block can be constructed as Chinese puzzle of these ideals. But the placement of these ideals within the building envelope causes in-between houses with even more unexpected spaces and qualities. (…) The concrete walls and floors absorb almost every possible contact between neighbors. It stimulates anonymity. This leaves a new role for the visual. Through this Chinese puzzle of houses, the neighbor is not visually hidden but present*".[21]

17 See, about dwelling typologies, MVRDV, *Farmax, Excursions on density*, *op. cit.,* p. 561, *"This opens opens up unprecedented opportunities for the role played by home catalogues. The cultivation of a maximum choice of housing types fulfills the wishes of the potential client, and covers the uncertainties of the market. This extension of the known ideals can be set up through a series of extended or extrapolated 'permutations' of the average house: this would lead from the straightforward front-to-back type to the stair type, the house with the superwindow, the house with no roof, the house with no walls, to the pit house, the catholic house, the house with the towers, the disconnected house, etcetera."*

18 *B*runo Marchand & Christophe Joud, *MIX*, op. cit., p. 42.

19 MVRDV, *KM3 : excursions on capacities,* Actar, *B*arcelona, 2005, p. 1008.

20 The importance of the intermediary spaces in collective housing buildings seems to be acknowledged in a more recent (although also unbuilt project called Carved Out Tower, in MVRDV, *KM3 : excursions on capacities, op. cit,* p. 1008 : *"By opening a normal tower typology, one that dominates the environment with four to five apartments per floor surrounding a core, we can criticize the existing residential development's lack of public space by creating large terraces for the new houses. It realizes garden-like spaces higher up. It creates the condition for suburbia on higher floors.".*

21 MVRDV, *F*armax, *op. cit.*, p. 561.

MVRDV, ***Pavilion for the Expo in Hanover***, 2000
Source: MVRDV website

MVRDV, project ***Silodam***, 2003
Source: MVRDV website

This idea that implicitly seems to be left open in Berlin voids – the overlay of public/communal spaces in height in the building has been explored a few years later in their seminal emblematic project-manifesto: the pavilion for the expo in Hanover, developed between 1997 and 2000, explored indeed ideas that we have seen in Rem Koolhaas's descriptions in Delirious New York (see chapter I), yet this time referring mainly to nature, landscape and public space: the pavilion claims to provide "*multi-level public space as an extension to existing public spaces*" [22] recalling the idea of a multiplication of an indefinite number of virgin sites on top of the existing land[23], and thus bearing a promising solution for the urban density and land scarcity.

Subsequently, the building epitomizes the character of an 'event'- a multi-layered massive park. "*At the same time the density and the diversity of functions builds new connections and new relationships. It can therefore serve as a symbol for the multi-faceted nature of society: it presents the paradoxical notion that as diversity increases, so too might cohesion.*"[24]

Aside with Berlin voids, the Hanover pavilion seems to become one of the themes that have eventually returned as leitmotifs, having been applied to other projects by MVRDV, within different approaches and strategies.

Silodam

MVRDV, 2003, Amsterdam

The first of this collection of sizeable, freestanding horizontal blocks conceived by MVRDV over the past years has been Silodam, built in Amsterdam between 2002 and 2003. This building, whose proportions may recall Le Corbusier's *Unité d'Habitation*, stands by the water at an industrial site, bearing an intricate combination of multiple apartment typologies, workplaces and a semi-public exterior area hanging over the water.

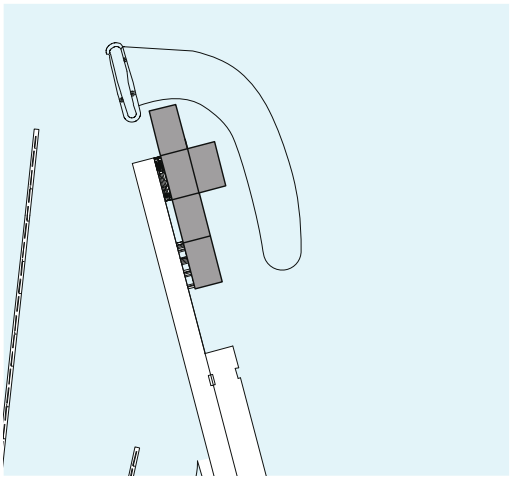
Indeed, the heyday of typological diversity is tested inside this horizontal superblock. It is also at the Silodam that the parallels with the *Unité d'Habitation*[25] are more evident: the form of the block, the proportions and the integration of

22 Source: https://www.mvrdv.nl/projects/expo (25/05/2016).

23 Rem Koolhaas, Delirious New York: A Retroactive Manifesto for Manhattan, The Monacelli Press, New York, 1975, p. 85: "*each of these artificial levels is treated as a virgin site, as if the others did not exist, to establish a strictly private realm around a single country house and its attendant facilities, stable, servants' cottages, etc*".

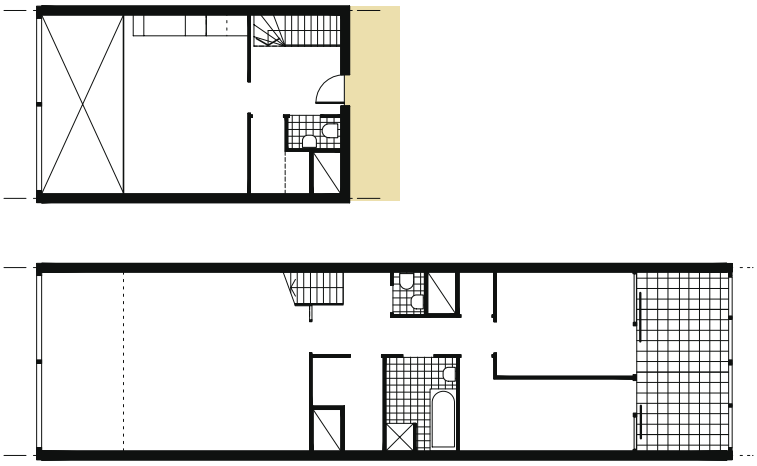
24 Source: https://www.mvrdv.nl/projects/expo (25/05/2016).

25 Possibly also stimulated by the design challenge - like a game or rubik's cube -, the building has been designed as a complex interconnection of mixed dwelling typologies, hosting therefore different types of middle class families. In this sense, the building has also been a precedent to a strategy of social mix that is particularly common amongst today's conception of collective housing and mixed housing buildings.

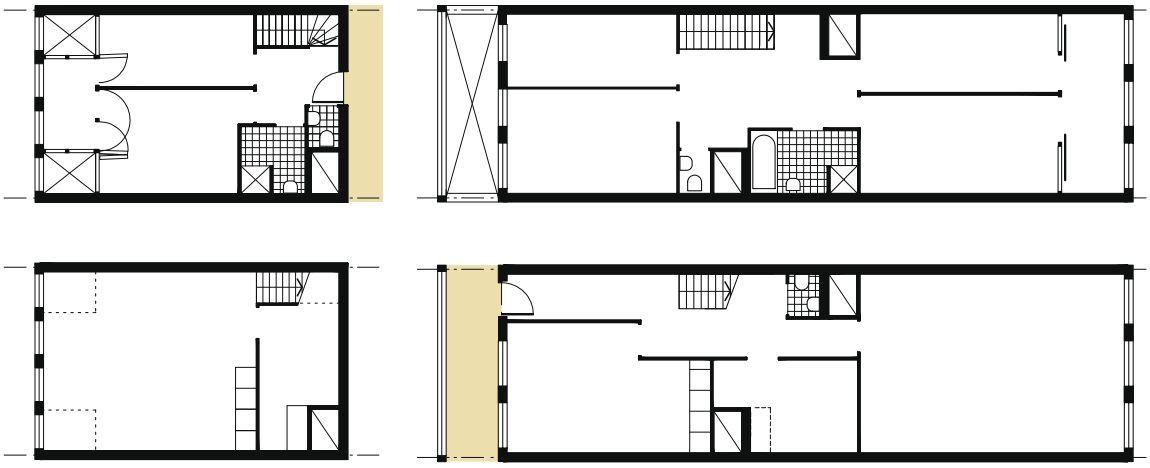


MVRDV, ***Silodam***, 2002
Source: base plans by Hilary French, 2008

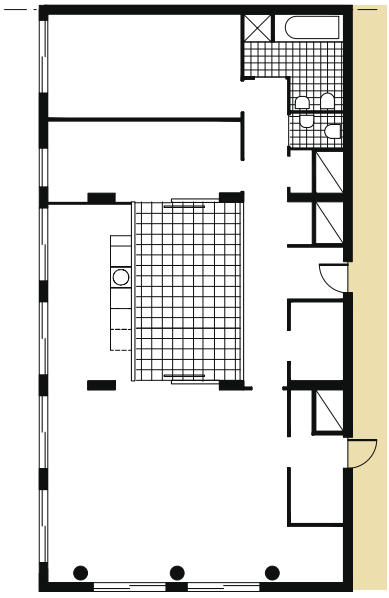
Floor Plans 1:1000
Source: base plans by Hilary French, 2008



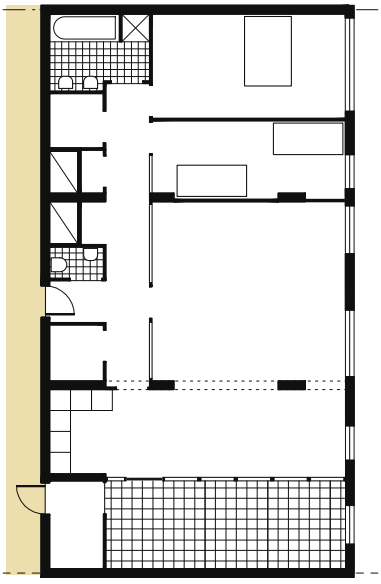
Floor Plans - Duplexes (levels 6-7) 1:200



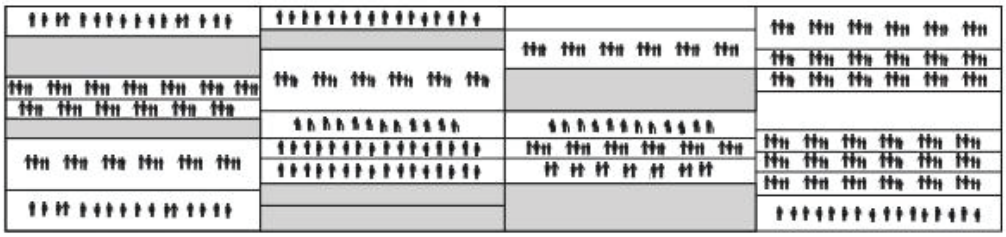
Full depth duplexes (levels 2-3) 1:200

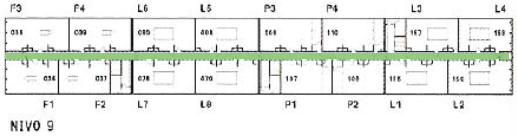


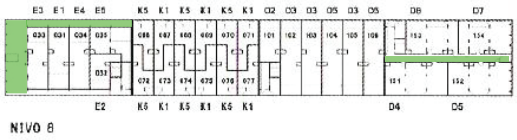
Patio Apartments 1:200

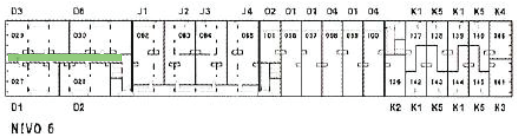


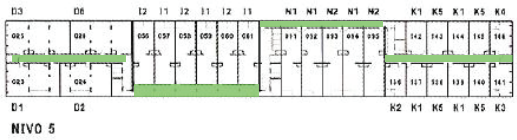
Penthouses 1:200

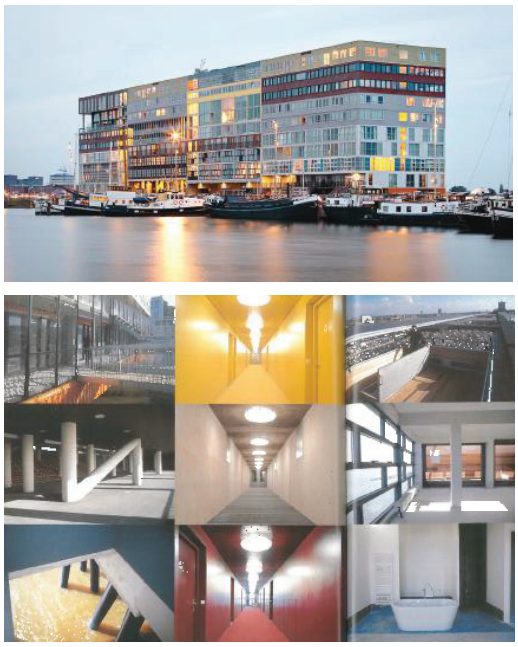












MVRDV, ***Silodam***, 2002
Source: El croquis 111 - MVRDV 1997 2002-3.

services within the same container are undeniably similar, aside with the idea that "*architecture and urbanism are one and the same*"[26]. When compared with Le Corbusier's *Unité d'Habitation*, the Silodam is nearly half the size and half the number of apartments (157 in total)[27], 10 floors and a total of 20'000m^2. However, it contains an even larger mix of apartment types and sizes. Conceived within a logic of neighborhoods, the different spaces within the building receive different material treatment. "*The demand for a large variety of living spaces has on the one hand led to different types but on the other hand, as a counterbalance to the increasing individuality, the different types of living spaces have been put together in 'little neighborhoods'. Groups of 4-8 of the same house type can be recognized by the same use of material in their fronts and also by the specific color of the hallways and galleries.*"[28] While Le Corbusier used a system of identical streets and kept the typological mix hidden within regular façades, MVRDV proudly extends the variety of its interior to the façade and to the internal pathways, lending it an expression of variety and contrast through the use of different openings and materials. Each neighborhood, just like in an urban environment, represents a small little universe with a particular expression in its proportion and tectonic treatment.

As explained by Hilary French, "*The seemingly random façades, a collision of different colours and styles, in part results from MVRDV's intention to avoid the usual horizontal stratification and create a three-dimensional version of urban space*"[29].

Nathalie de Vries explains the concept behind the Silodam: "*The choice of material types is quite random (if you forget about budgets and technical issues), most important is the difference itself. In the detailing of these wraps there are also big differences between projects. The windows are often designed from inside out. The smoothness of the Silodam, an object in a large space, the camouflage of the Hageneiland, where the elevations will blend in with greenery, flowers and garden equipment and, in the case of Unterfohring, the thickness of the façades which are being experienced from nearby mostly are urbanistically inspired choices. Individuality (…) pops up at the moments when the users start to be known (…) as the clients provided possibilities for the users to reposition walls, etc.*"[30]

At the Silodam, the concept of diversity goes even further: "*In addition to the diversity of surface and position that makes each house different are variations in orientation and proportion. These variations include width (5 to 15 meters), depth (half a block, whole block, diagonal over two floors), construction (walls and disc-like columns), outer spaces (serres, balconies, patios), floor heights (2.8 meters and 3.6 meters gross), layers (1 and 2), accessibility (corridor, gallery, bridge, stairs) rooms (1 to 5), the relation between floors by videos and different sorts of windows.*"[31]

26 *B*runo Marchand, Christophe Joud, *MIX*, *op. cit.,* p. 42.

27 *Aurora Fernandez Per, Javier Mozas ,* Density, New Collective Housing, *op. cit.*, p. 296.

28 *Ibidem, p. 296.*

29 Hilary *F*rench, *Key Urban Housing of the twentieth century, op. cit.*, p. 202

30 El croquis 111 - MVRDV 1997 2002_3.

31 A+u n° 11, *MVRDV FILES, op. cit.,* p.27.

MVRDV, project ***El Mirador***, 2005
Source: courtesy of MVRDV

But is all this variety worth it if the building does not provide enough spaces for social contact and encounter? The initial plan had indeed foreseen the existence of multiple shared and public spaces that ended up to be left behind; the only common space that is left is the a semi-public outdoor space over the water: *"Many of the original public spaces in the program were left out for financial reasons and the commercial space reduced by half. Public spaces that were included in the finished building include a marina for small boats in the open, colonnade in the central bays that allow views of the IJ through the building from the dock and a large open wood stair connecting to a colonnaded entrance deck and steps further to a raised wooden deck that extends out into the river overlooking the IJ on the east side of the building. The commercial spaces in the program are located under this deck that is left empty. The galleries that alternate in position and height also read as public spaces on the exterior."*[32]

This effort towards the stimulation of encounter was revealed also through the initial layout of commercial spaces. Shops were intended to be dispersed throughout different parts of the building as part of the overall three-dimensional composition – rather than the more usual horizontal zone at street level. A roof level terrace is accessible by the residents, there is mooring space for small boats available underneath the building, and there is also a restaurant and a public space: a large open deck with views over the harbor[33].

El Mirador

MVRDV, 2005, Madrid

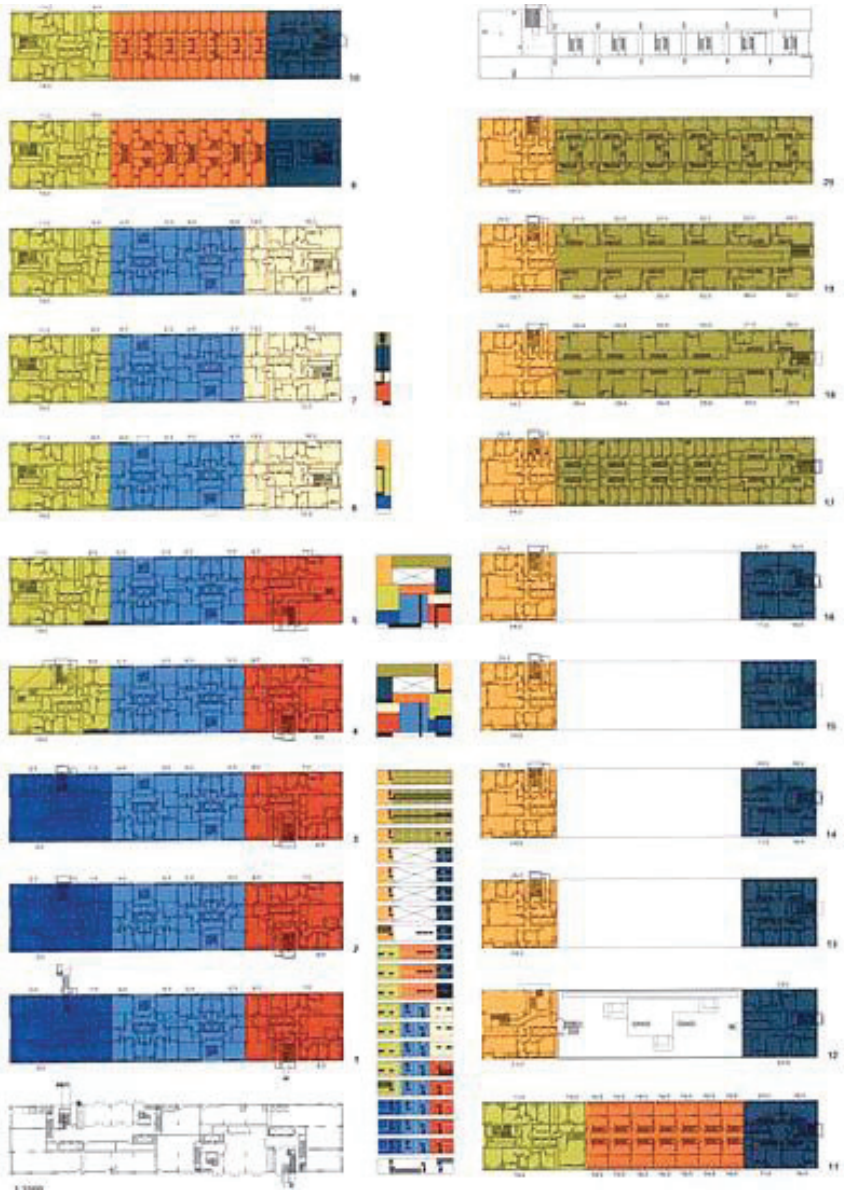
Although MVRDV's seminal project Berlin Voids has not been built, most of its basic principles have been applied to other projects that have been realized a couple of years after. One of these examples is the project "El Mirador", built between 2001 and 2005 in the suburbs of Madrid, in collaboration with the architect Blanca Lleó. Once again, the architects refuse to design a traditional city block organized horizontally - as endorsed by the local urban regulations - and conceive another vertical scheme with 22 floors - a new 'superblock' that, due to its height and exceptional features, immediately becomes a landmark: "*To break down the excessive uniformity and claustrophobia of the proposed design that asks for closed blocks of six story buildings, this apartment volume was developed as a reference point for the city extension and region at large. The 22 level building acts as a frame for the distant landscape and at the same time emerges as distinctive within the uniform city of blocks. The tower opens up public space demanded by the modern city.*"[34]

The building bears a regrouping of multiple different dwelling types (more traditional schemes, detached from the idealism experimented in Berlin Voids) that form neighborhoods - an idea that is explored in most of MVRDV's projects -

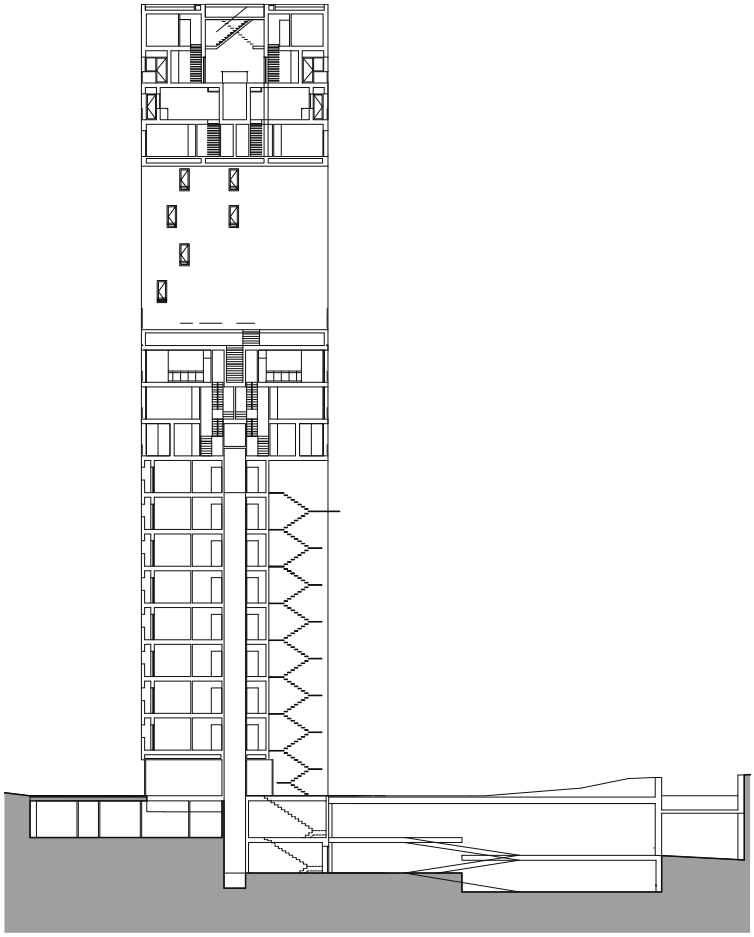
32 Housing Prototypes. Souce: http://www.housingprototypes.org/project?File_No=NL012 (28/06/2016).

33 Full description by Hilary French, *Key Urban Housing of the twentieth century, op. cit.*, p. 202.

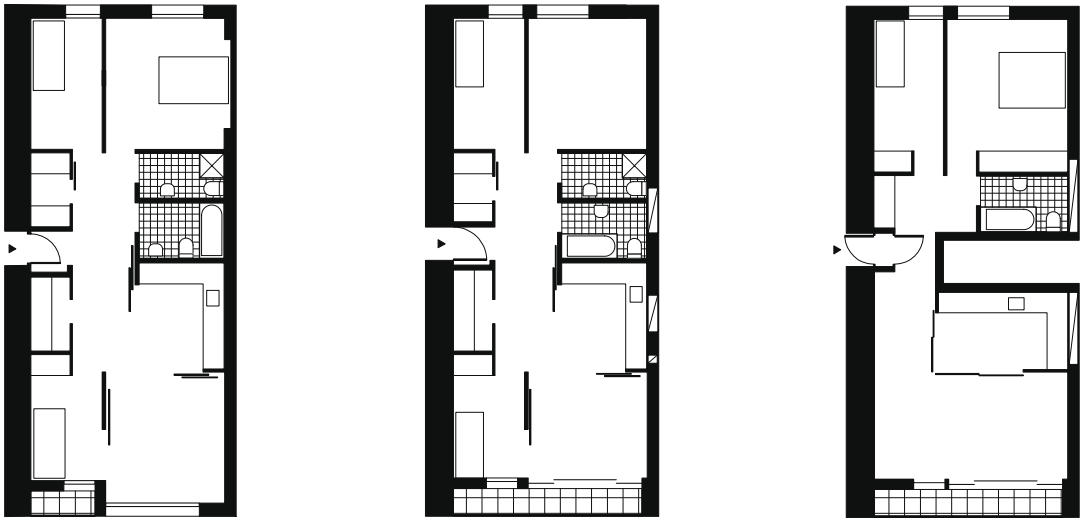
34 *Ibidem,* p. 561.



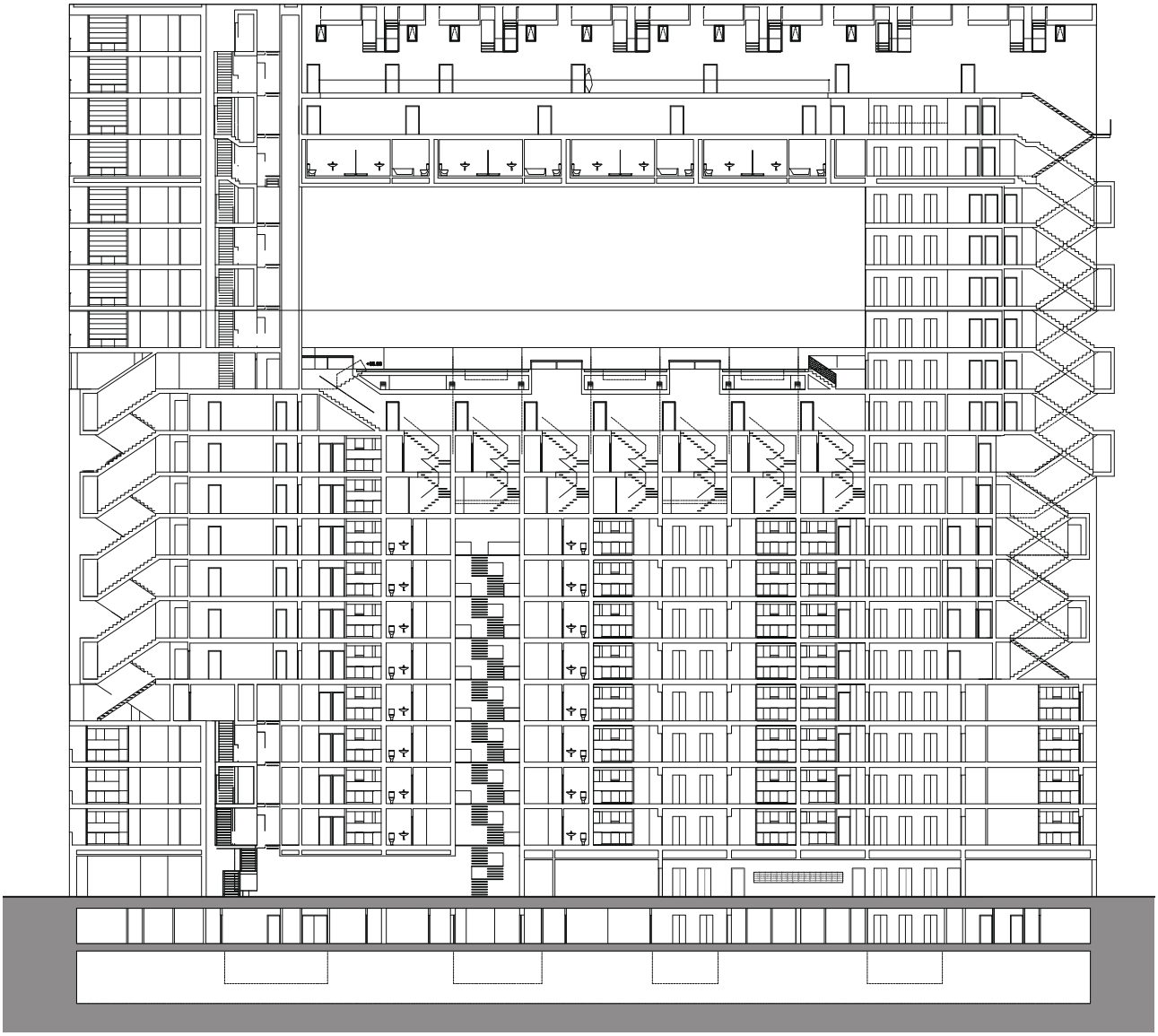
MVRDV, project ***El Mirador***, 2005
Source: courtesy of MVRDV



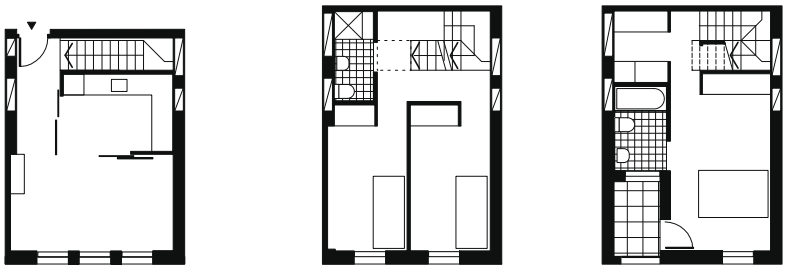
Cross Section 1:500



Typical apartments - floors 2-11 end block 1:200



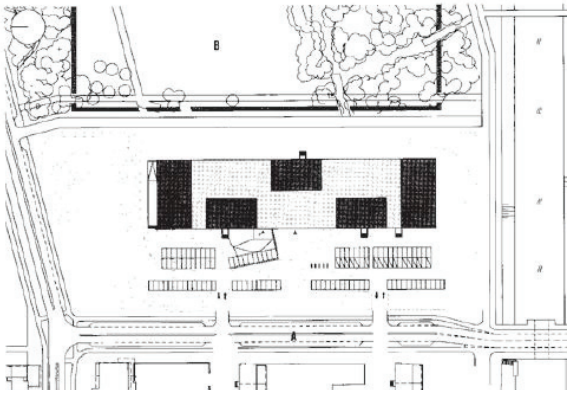
Long Section 1:500



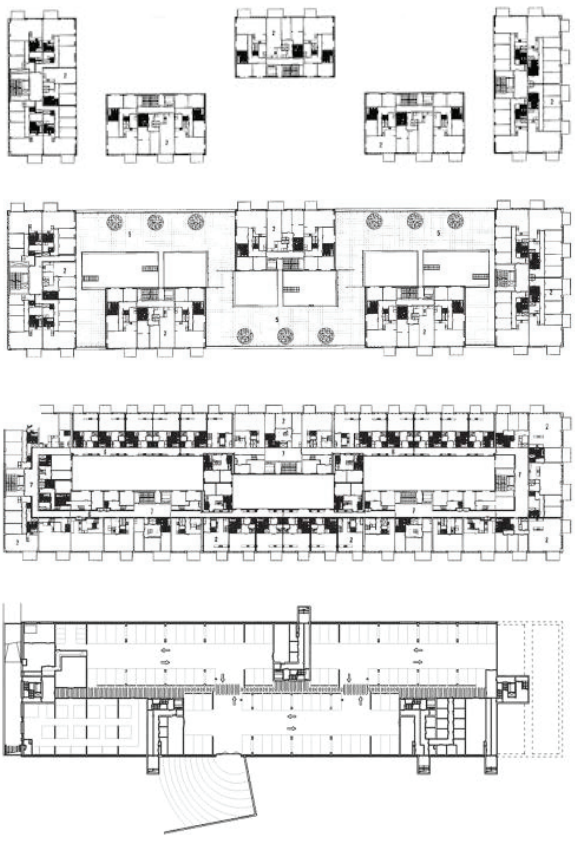
Plans of Triplexes 1:200

Floor Plans 1:500

El Mirador, MVRDV + Blanca Lléo
(source: base plans by Hilary French, 2008 - redrawn by author)




8100
Balkon
5.60 m²
Woonkamer
25.47 m²
Living
10.05 m²
Keuken
6.87 m²
Badkamer
6.64 m²
Slaapkamer 1
13.43 m²
Berging
5.39 m²
Slaapkamer 2
11.06 m²
Entree
8.52 m²
WC
1.36 m²
WD
WM
5297
8325



connected by vertical streets and expressed in the façade by means of nuances in the façade material - stone, concrete and ceramics. Most of the apartments have private outside spaces, generally loggias recessed within the overall volume and conceived as an extension of the living space or the kitchen. Duplexes on floors 19 and 20 have external terraces at roof level, accessible via open stairways that visibly criss-cross the double-height access corridor[35]. "*The 16'000 m² structure contains a wide variety of compact housing types integrating different social groups and lifestyles. In contrast to the serial and rationalist repetition of the standard family unit, the housing units are regrouped in small 'buildings'. These 'blocks', stacked and glued together, make up a new towering 'superblock'*"[36].

The circulation in the building is made through a network of small vertical streets and thus the building becomes an interesting compendium of dwelling types that are grouped into little communities. Each small neighborhood (from a total of nine) is expressed in the overall façade through a specific materiality – a feature whose importance has been highlighted, as we have seen before, by Monique Eleb and Jean-Louis Violeau. The big void in the façade is designated by the authors as "garden in height' or even 'viewpoint' and bears generous 'urban' dimensions: "*it has an approximate area of 580 m² on the ground (39.4 x 14.70 meters) and a height of 14.14 meters*"[37]. The communal spaces are concentrated within a unique central point located at the height of 40 meters, which provides an impressive and interesting view over the city – after which the project is named, "El mirador". The exterior treatment of this space invites inhabitants to stay there.

Parkrand

MVRDV, 2007, Amsterdam, NL

The ideas of perforation, articulated with housing quality and variety within dense schemes in a more recent project from MVRDV. Parkrand is located near a large park in western Amsterdam and it was completed in 2007.

Replacing 3 l-shaped housing buildings from the 1950s, Parkrand occupies a smaller footprint and includes about twice the number of apartments of the former buildings, with larger and more varied dwelling sizes and higher quality, while it also liberates area for the park – a clever example of densification.

Parkrand is a sizeable freestanding residential building with a total area of 35'000 m2 containing a total of 224 apartments organized within "*five towers that are 'sandwiched' between a large, raised communal patio and a series of rooftop penthouses*"[38]. The

35 Description of the dwelling types at Hilary *F*rench, Key Urban Housing of the twentieth century, King Publishing, London, 2008, p.222.

36 A+u n° 11, 2002, MVRDV *F*ILES, op. cit., p.196.

37 Aurora *F*ernandez Per, Javier Mozas , Density, New Collective Housing, a+t, Vitoria-Gasteiz, 2004., p. 200.

38 "*A certain ambiguity results from combining the two ideas: is the driving concept one of connected*

succession of voids that is generated in the space in between the towers (eight story-high voids) allow several advantages that have to do with views to all directions and provide an efficient solar exposure to most of the apartments. At the same time, these perforations allow for visual proximity between the semi-public raised patio and the nearby park. This building is said to be a reinterpretation of Le Corbusier's *garden-city* principles: "*the challenge for planners in recent years was how to maintain the garden city qualities of these communities while building dwellings at increased densities*"[39].

Parkrand contains a large typological diversity of dwellings, ranging from flats to large maisonettes and mixing also different forms of access to the different apartments. Ultimately, the different dwelling typologies translate into different volumetric configurations - in some points resembling towers and, in some other points, bridges connecting two opposite sides of the building. In the middle floors, the traditional tower layout contains 3 or 4 flats organized around a central core. The two upper levels of the building form a sort of continuous gallery connecting the lobbies of the towers and providing access to the maisonettes. Some other apartment typologies have direct access from the lower courtyards. A feature that is common to the majority of the apartments is the fact that they contain balconies that are oriented either towards the nearby park or to the interior garden, emphasizing the garden-city concept that is implicit in the project[40].

"The garden offers protection from rain and wind, secured access, and more intimate spaces and playgrounds. This area becomes a central space for the inhabitants, an outdoor 'living room'. This idea is accentuated by the use of soft furniture, decorative walls, ceiling and floor finishes, plants, and 'chandeliers'"[41]. One should indeed highlight the importance of these exterior elements, mainly when it comes to sitting areas: "*The most elementary provision to enable people to take possession of their direct environment is probably the provision of seating (the opportunity to seat one-self having everything to do, linguistically, with settlement). A place to seat offers an opportunity for temporary appropriation, while creating the circumstances for contact with others*"[42].

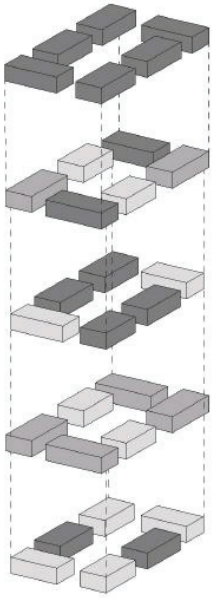
towers or is it one of an eroded volume? This ambiguity is also evident in the plans. The bottom two floors and the top two floors are organized around two long rectangular voids that make an entrance court at the first floor, and provide day lighting from the top. The 8 floors in between are organized as 5 freestanding rectangular towers, each with a service core and each entered from the courtyards at the first floor. At the top two floors the towers are connected to each other with bridges that have continuous galleries connecting the tower cores as a two-story high zone of maisonettes. Entrance is made at the second floor from the parking area in front of the building. This is one-half floor above the level of the park on top of a level of basement parking. This gives access to the tower lobbies and includes a zone of dwellings that align with the bridges of the top floors. The roof of this zone of dwellings (the top of the plinth) is used for three, semi public roof gardens.", in http://www.housingprototypes.org/project?File_No=NL008 (28/06/2016).

39 AV Monographs, 126, 2007, pp. 74-81.

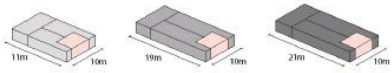
40 Source: http://www.housingprototypes.org/project?File_No=NL008 (28/06/2016).

41 Architecture In The Netherlands, 2007/08, UAi Publishers, pp. 70-73.

42 Doris Zeller, ""Ground-Floor Zone – Entrances and Transitions", *op. cit.,* p. 150.



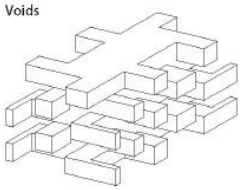
Blocks



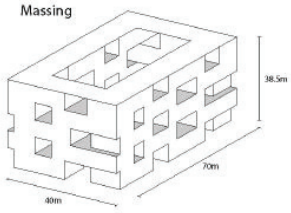
	Housing	Shops	Total	Total Area
L	7	5	12	5665 m²
M	7	1	8	3577 m²
S	16	0	16	6489 m²
Total	30	6	36	14487 m²

Plans

Voids



Massing



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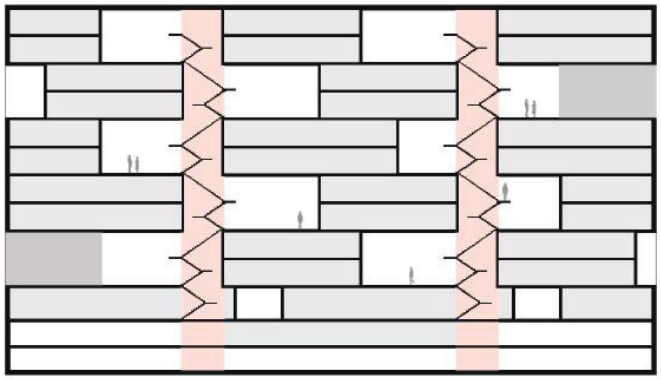


Celosia

MVRDV, 2009, Madrid

Aside with the typological diversity, the exploration of 'holes' – as a form of adding exterior collective areas to the building and enhancing the neighborhood feeling – has been explored in several projects signed by MVRDV.

The volume of Celosia is a perforated block whose wholes are distributed regularly throughout the ensemble. The program mix includes a total of 146 dwelling units, communal exterior spaces (the holes and the central courtyard), and also parking and retail at the plinth. The overall volume of 13'800 m2 is a composition of 30 small volumes and 30 void areas [43]. "*They are positioned in a checkerboard pattern next to and on top of each other in such a way that they leave openings for communal gardens in between. A perforated block appears, in which shadow and ventilation compensate for the strong climatic constraints.*(...) *It creates views from the street through the building. It creates views from the houses to the surrounding area. "It defends against the claustrophobic conditions of the existing developments*" [44]. Besides creating potential for communal life and recreating a certain form of urbanity, these holes also represent some sort of openness towards the city, as if the city was invited to penetrate the building.

It is indeed intelligible that the success of a collective housing building might depend not only on the quality of its floor plans, but also on the design and quality of is public and semipublic connections. "*The intersections between the various realms of being with others and being alone are extremely important as are the opportunities for residents to appropriate the spaces*."[45]

The importance of these spaces is enhanced by Doris Zeller in *Housing +*, in her analysis of "spaces of social coexistence": *"Spaces where the functions are not clearly defined and where it is not absolutely clear where they belong become zones of conflict and thus present an opportunity for appropriation (…). Appropriation is always aimed at both spatial and social dimensions, that is, at the physical environment itself, at relationships to people that are possible within it, at its normative structures"*[46]. But besides the importance of the pure existence of these spaces, their architectural treatment is equally important. As indicated by Zeller, the design and the tectonic treatment of the exterior open spaces may play an essential role on its appropriation*: "what materials are offered and how do they invite people to use the space?"*[47].

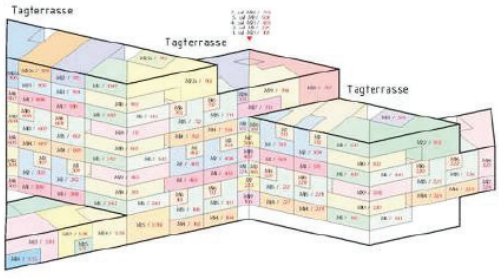
43 *Ibidem*, p. 214.

44 *Ibidem.*

45 Doris Zeller, ""Ground-*F*loor Zone – Entrances and Transitions", *in* Ulrike Wietzorrek, *Housing +: on thresholds, transitions, and transparency*, *B*irkhäuser, *B*asel, 2014, p. 150

46 *Ibidem*, p. 150.

47 *Ibid.*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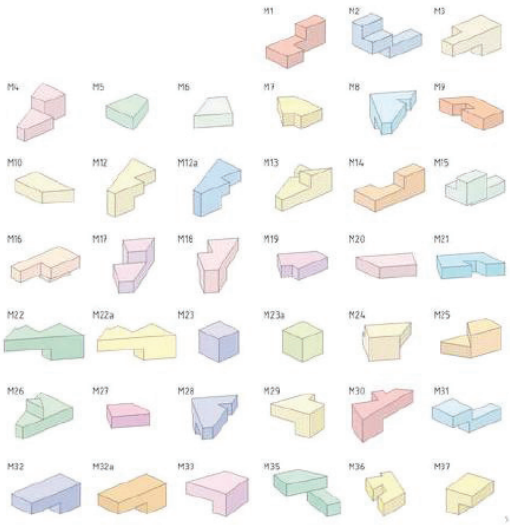
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Despite the comfortable dimensions of Parkrand's intermediary terraces, the lack of additional elements in their treatment may turn them into 'naked' concrete spaces that may not be very warm or inviting for users. We believe that such spaces had the potential to be explored more intensively. Nonetheless, the overall views of the building that can be perceived from these spaces must be highlighted, as well as a general feeling of visual integration and connectedness that isn't felt for instance at the Solidam nor at el Mirador. Moreover, there is possibly an interesting aspect associated to the thrill and comfort of a constant visual feeling of life in community without while we still manage to ensure privacy, as much as perceiving the neighbor from one of these terraces without forced conviviality may also be an interesting feature of the building.

VM house

BIG+Julien de Smedt, 2005, Copenhagen

Despite the important contribution of the work of MVRDV to the theme of typological mix, other architects, such as BIG, have also produced a significant amount of work on the subject, often departing from Le Corbusier's precepts for inspiration as well.

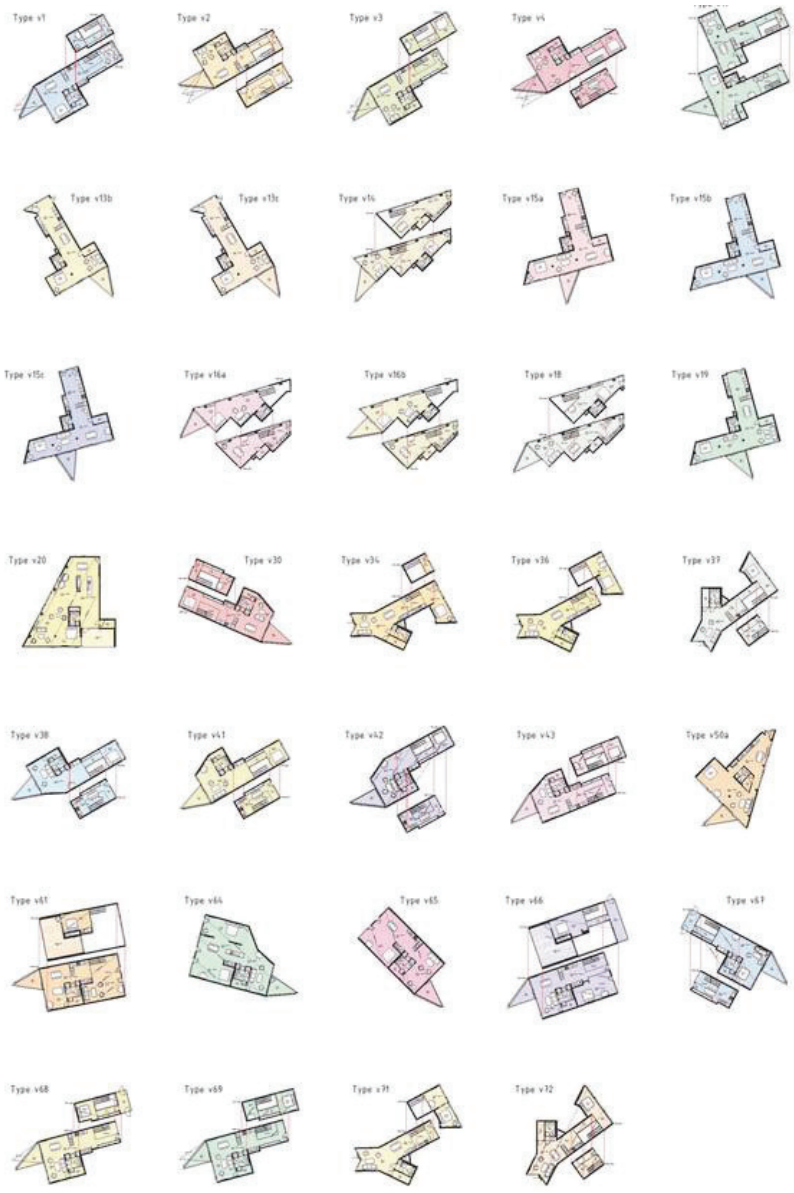
The project VM house in the new urban area of Ørestad - a non-dense area in the outskirts of Copenhagen - was designed by BIG in collaboration with Julien de Smedt in 2005. The project bears similarities with MVRDV's Berlin voids, in its exacerbated typological variety of dwellings, a feature that is highlighted in Julien De Smedt's description - "*Buildings are like a game of Tetris in three dimensions, formed by the people dwelling units*"[48]. Yet, the assumed source of inspiration for this project is Le Corbusier's imbricated typologies of the Unité d'Habitation, aside with the communal areas and the corridor streets.

The housing complex named VM House is a combination of two facing housing volumes; one of them bearing a V-shape and the second one a M-shape (both in plan) with a total 25'000 m2. Although one cannot really speak of functional mix, the project includes some communal services like a kindergarten and a play area, as well as a semi-private courtyard for the inhabitants with a learning centre. The authors claim to have improved Le Corbusier's concept for the Unité d'Habitation: "*In this project the typology of the Unité d'Habitation of Le Corbusier is reinterpreted and improved: the central corridors are short and receive light from both ends. The building volumes provides optimal air, light and views for all flats. All apartments have a double-height space to the north, and wide panoramic views to the south*"[49].

The VM project contains 225 dwellings and more than 80 dwelling types. Bearing a declared allusion to the scheme of the *Unité d'Habitation*, the different dwellings are accessed from a central interior corridor (analogue to the 'interior street') linked to the elevators and stairways. Yet this inner corridor claims to be more appealing than the Corbusean 'interior street' because of its bright colour treatment and daylight openings on both ends, promising to be more inviting to the social interaction between neighbours than its seminal reference model.

48 Source: https://en.wikiarquitectura.com/index.php/VM_House (28/06/2016).

49 Source: http://jdsa.eu/vm/ (28/06/2016).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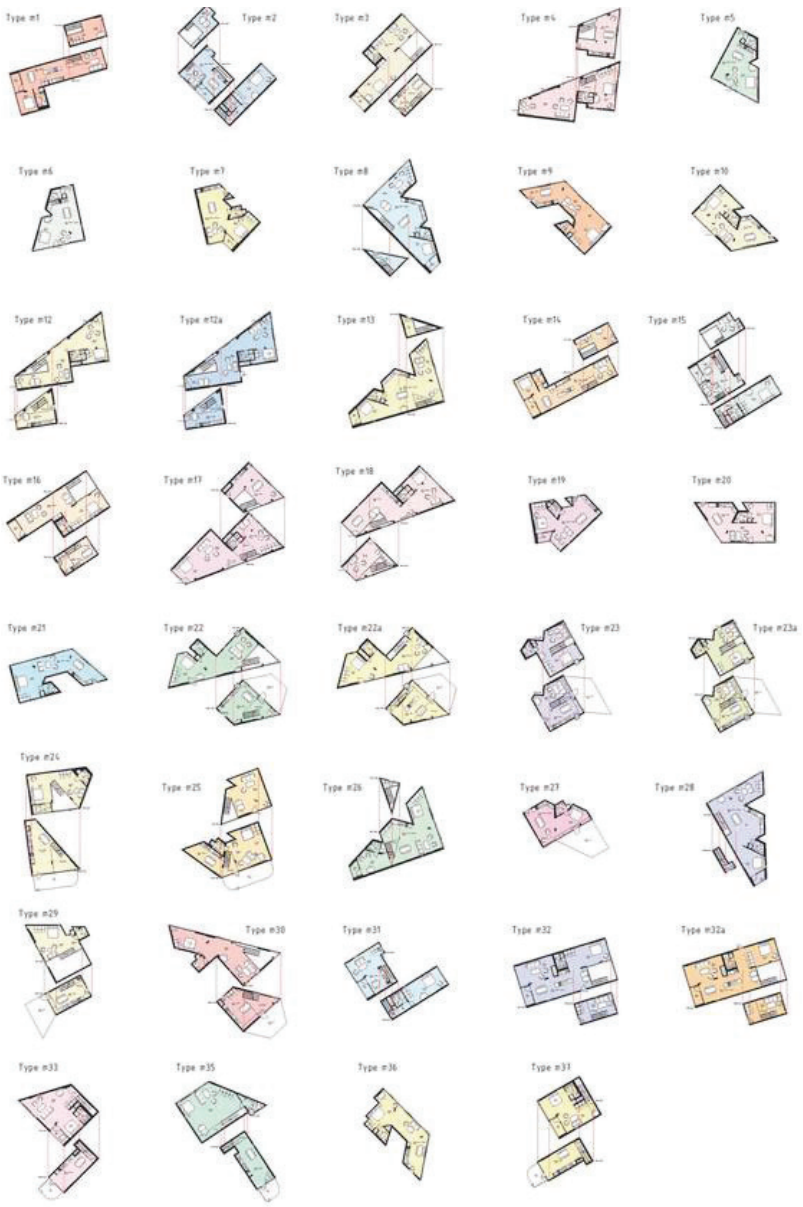
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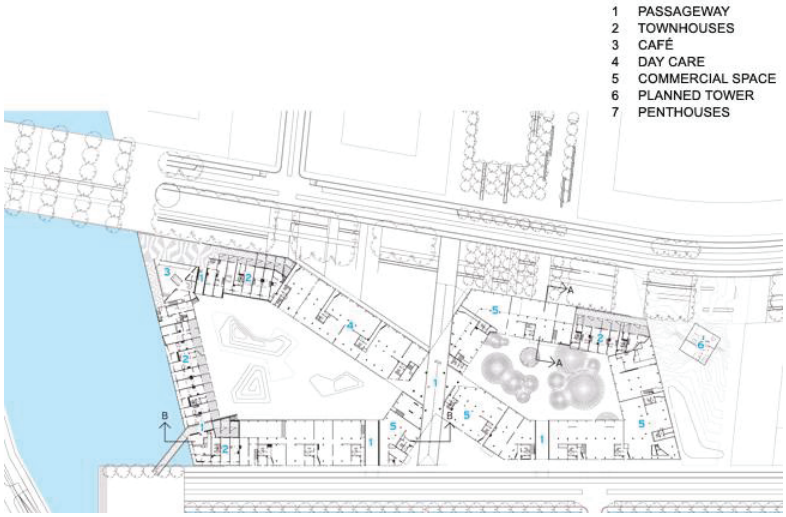
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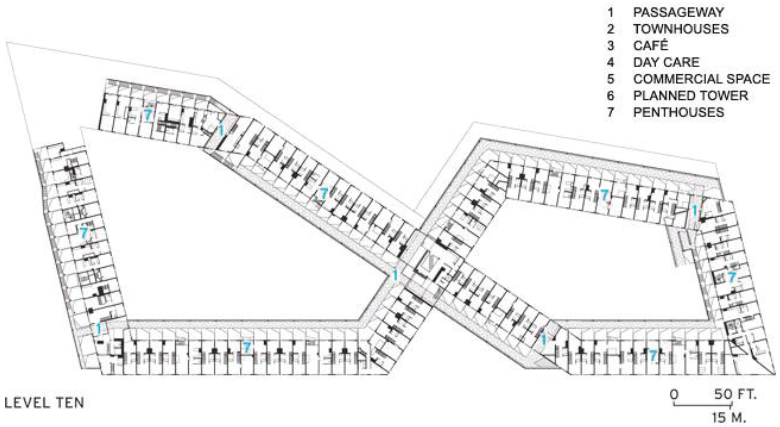
3 CAFÉ
4 DAY CARE
5 COMMERCIAL SPACE
6 PLANNED TOWER
7 PENTHOUSES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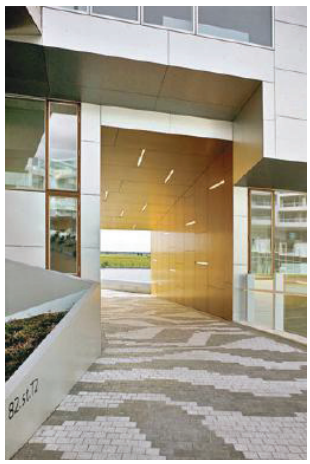


8 Tallet (8 House)

BIG, Copenhagen, 2010

The second building designed by BIG for the neighbourhood of Orestad, completed in 2010, is named 8 House (also called *8 Tallet*). It is a large-scale and dense[50] housing/office building, despite its urban location at a low-density[51] area of the city. It occupies two plots and adjusts to the roads running parallel to the nearby metro line. The 8 House is particularly noticeable because of its unusual shape and size, as much as it is particularly thrilling due to the way it breaks the inherent size and density[52] of the block through multiple small scale features and details.

The bowtie-shaped building of *8 House* has a total area of 62'000 m^2. It combines housing (81%), offices (8%), retail (8%) and facilities (3%), hosting a total of 476 dwelling units of three different types, providing dwellings of multiple sizes, townhouses and penthouses for different family types and life stages - as well as 10,000 m2 of commercial services and office spaces.

Following the statement that "*a city becomes alive when it is rich with experiences and surprises*"[53], the challenge of 8 House has been "*to recreate the thrill of the urban complexity within a unitary building*"[54], often bearing opposed values, like diversity and consistency. The building seeks indeed to reinterpret the functional and social variety found at the historic city, yet instead of the row houses and programs placed aside, "*different functions are stacked like an urban layer cake* - "*instead of dividing the different functions of the building (for both habitation and trade) into separate blocks, the various functions have been spread out horizontally*"[55] - with the stacking of the different functions and each one finding its optimal niche in regards to specific functional and spatial requirements. Shops and offices are placed at street level allowing for a better contact with the public. Therefore the whole commercial/office area is placed at the bottom. Houses are placed above, having more privacy from the urban street.

50 *"The inventiveness extends to the smaller scale with cleverly conceived components, such as a zigzagging cable system supporting the stairs inside two-story apartments and the outdoor ramp's stone paving pattern delineating a slope gradual enough for people in wheelchairs."* In Joann Gonchar, "8 house", *op. cit.*

51 "(…) *the aim was to build a "three-dimensional community even though the building is in the middle of nowhere," says Ingels. The "nowhere" is about 7 miles from the city center at the southern tip of Ørestad, a still somewhat barren district rising along a branch of Copenhagen's new metro line.*", Joann Gonchar, "8 house", *Architectural Record*, August 2011.

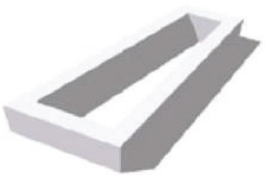
52 *F*loor area ratio: 2.98.

53 Project presentation by *B*jarke Ingels. Source: https://vimeo.com/3499612 (28/06/2016).

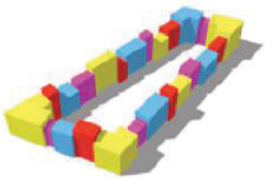
54 *Ibidem.*

55 *B*jarke Ingels Group, *BIG: Projects 2001-2010,* Design Media Publishing Limited, Hong Kong, 2011, p. 136.

PROJECT STRATEGY

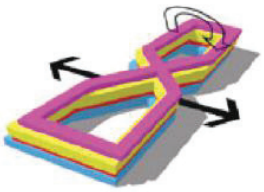


Basic perimeter block



Wish: variety - «a city in a building»

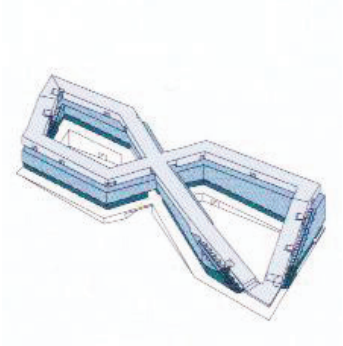
Layered functions according to needs:
commercial/offices below, residential above.



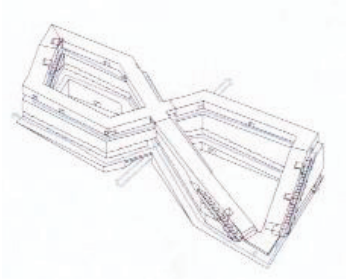
Masterplan requirement: passageway
linking squares.

Playing with heights of functions to achieve variety;
Pinching down SE corner: view to nature, reduce solar gain.
Pulling up NE corner offices: shade loving.

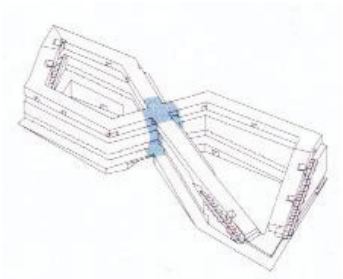
INSERTION IN THE GRID



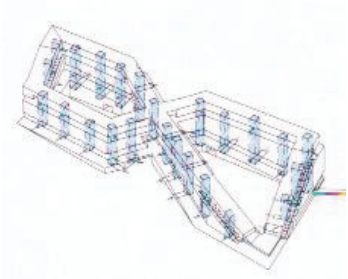
TYPES OF DWELLINGS



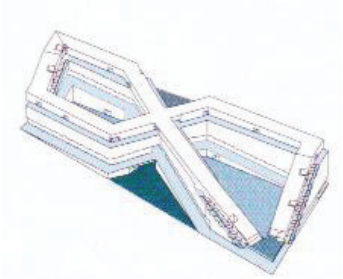
CIRCULATIONS



COMMUNAL SPACES



ACCESSES



EXTERIOR SPACES

Source: a+t, *Why density?*, 2015, pp. 210-243

"The apartments are placed at the top while the commercial programme unfolds at the base of the building. As a result, the different horizontal layers have achieved a quality of their own: the apartments benefit from the view, sunlight and fresh air, while the office leases merge with life on the street. This is emphasized by the shape of 8 House which is literally hoisted up in the northeast corner and pushed down at the southwest corner, allowing light and air to enter the southern courtyard."[56]

Bjarke Ingels describes the project as *"an entire neighbourhood conceived at once, as one building."*[57] As shops and offices call for deeper floor plans than housing, the difference is occupied with a special street that links the entire building. Consequently, this lively urban neighbourhood *is "connected by a continuous promenade and cycling path that goes up to the 10th floor, allowing people to bike all the way from the streets up to its tenth level penthouses alongside terraced gardens"*[58]. Thanks to the stonework materiality of this connecting path (very similar to the one of cities) – one has the real feeling of walking on a street of a citadel. Moreover, it is from this street that one can access each apartment – each house having a small buffer green zone in between – which lends to the scheme the real feeling of suburban townhouses, accessed directly from the street. "*The most unusual aspect of 8 House, one that stops just shy of gimmicky, is a continuous open-air ramp. Along with stairs and elevators, it provides access to the townhouses and penthouses as it loops around the building, stretching from the street level to the top floor and back again. More than any other feature, the ramp is intended to imbue the mammoth complex with a sense of community: Where social life, the spontaneous encounter, and neighbour interaction are traditionally restricted to the ground level, the 8 House allows them to expand all the way to the top.*"[59]

Thanks to these multiple innovative features, the building is described as a "*three-dimensional urban neighbourhood*"[60], combining both urban complexity and the "*intimacy of an Italian hill town*"[61]. The architects have designed an elongated, articulated housing building with significant height differences as a strategy to let light reach the different façades of the building, and to leave intermediary gardens that are intended to strengthen the local community. "*The building is strategically reshaped in order to provide the apartments with the best views and lighting conditions, as well as the courtyards receiving the afternoon sun. The two distortions of the block – necessary to optimize and provide each function with optimal view, daylight and sunlight causes the walkway to rise and fall – becoming one continuous mountain path which moves all the way to the northeastern corner - connects to the upper part, continues all the way to the top of the block and from this point all the*

56 Thomas Christoffersen, Partner in Charge, 8 House, *B*IG. Source: http://www.e-architect.co.uk/copenhagen/8-house (28/06/2016).

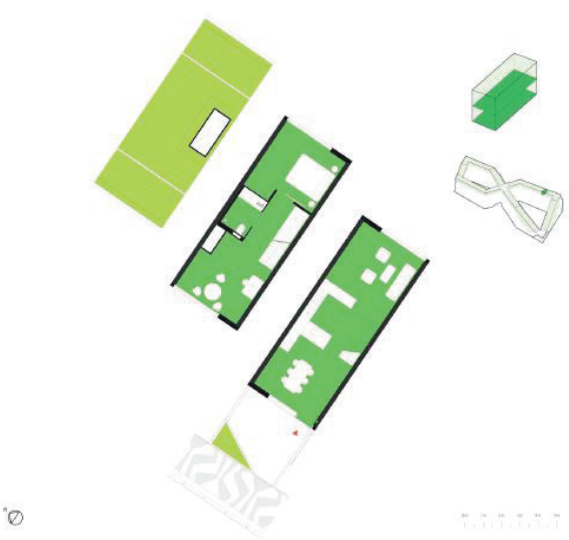
57 Project presentation by *B*jarke Ingels. Source: https://vimeo.com/3499612 (28/06/2016).

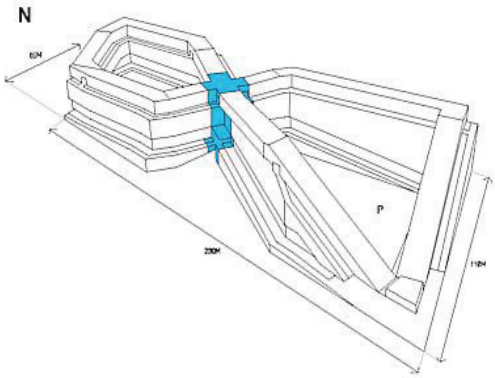
58 Jae-Yeun Shim, *Bjarke Ingels Group*, Archilife, Seoul, 2010, p. 168.

59 Joann Gonchar, "8 house", *op. cit.*

60 *B*jarke Ingels Group, *BIG: Projects 2001-2010, op. cit.*, p. 136.

61 Joann Gonchar, "8 house", *op. cit.*

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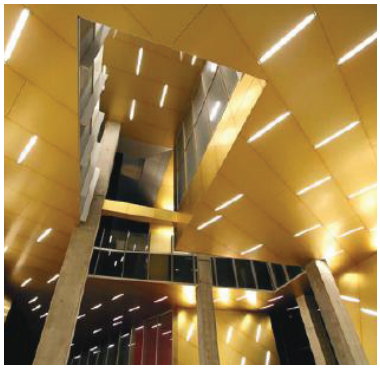


way down to the bottom again"[62]. Thomas Christoffersen, Partner in Charge of the project at BIG, highlights the fundamental advantages of the design strategy: "*The different horizontal layers have achieved a quality of their own: the apartments benefit from the view, sunlight and fresh air, while the office leases merge with life on the street. This is emphasized by the shape of 8 House which is literally hoisted up in the Northeast corner and pushed down at the Southwest corner, allowing light and air to enter the southern courtyard*"[63].

Simultaneously, two intimate interior courtyards with distinct characters are created, separated by the intersection zone of the cross. In this same intersection spot, a passage with 9m width allows for the pedestrian flow between the western park zone and the eastern side of the water canals. Within this knot, 500 m^2 of communal facilities are concentrated under the form of a "*social tower of empty space tying or linking the house together from basement to penthouse*"[64]. This space hosts intermediary facilities for the users, like meeting rooms, canteen for parties with kitchen and outdoor spaces for barbecues. The tectonic treatment of this zone differs from the rest of the building – the cladding is made of aluminium gold composite panels so as to be noticed as a communal space within the block.

"*BIG has partly been inspired by classic townhouses as well as the open, democratic nature of functionalistic architecture*"[65]. It is strategically reshaped in order to provide the apartments with the best views and lighting conditions, as well as to bring the afternoon sun to the courtyards. The block is distorted in order to allow the optimization of the views and sunlight, which ultimately leads to the rise and fall of the walkway that functions like an uninterrupted mountain path.

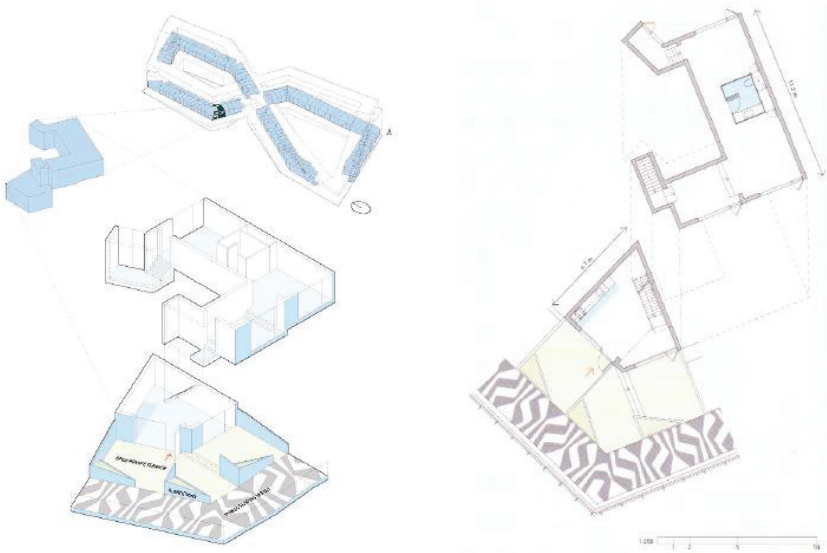
62 See images in *B*jarke Ingels Group, *BIG: Projects 2001-2010, op. cit.*, p. 136.

63 Gina Tsarouhas, *Green Walls Green Roofs: Designing Sustainable Architecture*, The Images Publishing Group, Australia, 2014, p.217.

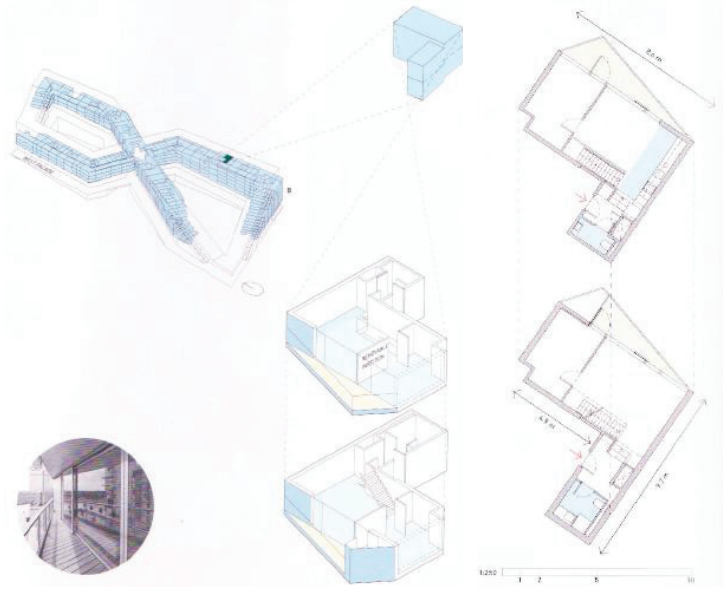
64 Aurora *F*ernandez Per, Javier Mozas, Alex Ollero, Aitor Deza, *Why density?*, a+t, Vitoria-Gasteiz, 2015, p. 220.

65 Jae-Yeun Shim, *Bjarke Ingels Group*, *op. cit.,* , p. 168.

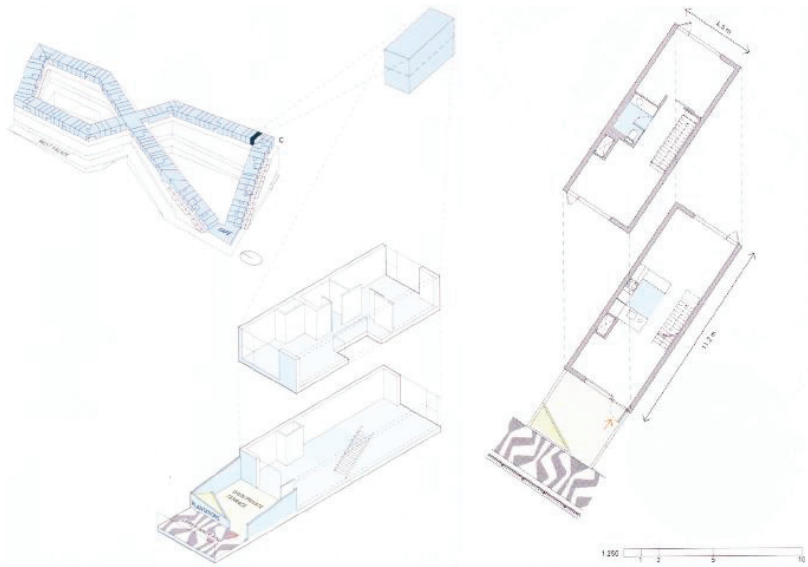
TERRACED HOUSES



APARTMENTS



PENTHOUSES



Source: a+t, *Why density?*, 2015, pp. 210-243

The typological diversity of the dwellings results on multiple different accesses, ranging from the open 'streets' to the vertical cores, most of them located on the façades facing the street (and thus reinforcing the bond with the city space at the ground level). Amidst the three different dwelling types, we can find three main categories:

a) Terraced houses with an average area of 100 m^2 (recalling the character of the historical Kartoffelraekkerne[66] rowhouses[67] that can be found in Copenhagen's city centre); this typology includes two floors plus under-roof space – a reinterpretation of the concept of a small front courtyard;

b) Apartments ranging from 46m^2 to 152m^2 – these are located in between the ground floor dwellings and the penthouses and their floorplan reduces as one goes up in the building;

c) Penthouses ranging from 73m^2 and 171m^2, taking the form of two-storey or three-storey maisonettes; these are directly accessible on foot, from the urban ground (on the south-west corner of the building) by means of exterior staircases.

66 Kartoffelrækkerne also called Farimagsgade district is a neighborhood in Copenhagen consisting of 480 houses built by the Workers construction association. "*Kartoffelrækkerne was built in 1873 after English model and was designed by the architect Friedrich Christian Bøttger . The houses were public housing built by the Workers Construction Association (Arbejdernes Byggeforening), an association initiated by the workers at Burmeister & Wain . One of the nicest of the social housing projects to emerge at this time, 1873-1889, was Kartoffelraekkerne, a neighbourhood that runs along the northern end of the lakes, consisting of a long ladder of narrow streets built in very straight rows – hence the name: 'potato rows'. Kartoffelraekkerne is today one of Copenhagen's most expensive, in-demand neighborhoods, loved by locals for its palpable sense of community, with picnic tables in the street, kids playing and residents chatting in their well-tended-to front yards*." http://lakesidehouse.dk/index.php/area/13-kartoffelraekkerne

67 http://architizer.com/projects/kartoffelraekkerne/

The reproduction of the thrilling complexity, functional diversity and social mix of the urban diversity within an architectural container.

The importance of the program planed at the ground level for the articulation between building and city.

The importance of well planned communal spaces intercalated with typological mix.

Horizontal circulation logics prove to trigger more social interactions and encounter than the vertical schemes.

Author Diagrams.

3.2. Density, typological and Social Mix – Concluding notes

Throughout the two parts of this chapter, we have analyzed several different forms of mixing, in history and contemporaneity, and how these can be associated and explored within the reality of the Big Building. Designed as a model capable of economizing resources - especially when it embodies residential uses - the Big Building represents a chance sample that includes the gene of the mixed-use development in its code (Aurora Fernandez, Javier Mozas & Javier Arpa, 2011). Within the Big Building, the concept of mix can primarily be incited at two different - yet simultaneous - levels: the mix of uses (the coexistence of several disparate programs) and the mix of housing (social, generational, typological).

Mixed-use buildings that include housing are said to be the places where density and diversity can blend to form complex relational systems. Its very first precedent was the traditional mixed-use housing building, combining commercial/retail uses (at the ground level) and dwellings (at the higher levels); it appears over many periods of history and in most cities in the world (Howard Davis, 2012). Gradually, and in some particularly dense points of the globe, this simple model has mutated into a model of hybridity, raising new questions about urbanism deployed vertically. It can either be incited by the density of the urban fabric, like in the case of the American hybrids (early 1920/30) - *"The hybrid type was a response to the metropolitan pressures of escalating land values and the constraint of the urban grid. With horizontal movement restricted, the city fabric moved skyward. (…) Unable to occupy these vast new volumes with an individual usage, functions were combined."*[1]. Nonetheless, mixed and dense buildings can be driven by other motivations. Departing from a simultaneous repulsion and fascination towards the skyscraper and the vertical stacking of functions, and from a simultaneous need for providing cost-efficient solutions of mass housing, Le Corbusier has designed his own ideal model of *vertical city* within a building. Occupying a non-densified suburban area, the *Unité d'Habitation* has been designed according to Le Corbusier's own rules and vision of density. This time it was not the lack of land the one to trigger density, but rather a *grandeur conforme* defining the amount of housing and related services to be juxtaposed and stacked vertically within the large container. Unlike the American examples, this scheme ensures the coexistence of horizontal circulation, which adds a wealthier *urban* character to the building and intensifies fluxes. However, the fact that it disconnects from the density of the city weakens its potential.

Gradually, the concept of mix is being applied to social values. We have observed that the recent production of urban planning and innovative collective housing buildings (namely in France and in the Netherlands) recurrently explores and incites a condition of *social mix*, departing from the statement that the spatial proximity of different inhabitants leads to the retraction of the social distance and

1 Joseph *F*enton, *Hybrid Buildings*, Pamphlet Architecture n. 11, New York, San *F*rancisco, 1985, p. 5: "Within relatively short period of time hybrid buildings enveloped many of the institutions which comprised the Nineteenth century city: dwellings, offices, theatres, museums, courthouses, jails, factories, bridges and terminals."

generates an overall environment of social cohesion (Monique Eleb & Jean-Louis Violeau, 2000). Several architects seem indeed to work towards the exploration of this principle. For MVRDV, *"it is unthinkable that the higher floors are used only for the more expensive apartments, so that the rich are sitting on top of the poor"*[2]. Thus, the social mix is often explored through the innovative planning of mixed housing typologies, allowing for different lifestyles to coexist within a building and moving forward on the creation of "traditional neighborhoods" and multifaceted social environments inside each building. The effort is enhanced through the design of collective courtyards, accessibility or public areas, bringing urban features and qualities to the inside of the building.

Fundamentally, the concept of mix that we are aiming to explore envisions not only the mix of housing with other programs and its articulation spaces, public and private spaces, internal and external users, but also the mix of housing typologies, as well as the social mix that can potentially be generated by means of a planned typological and constructive diversity.

The main principle is to verify whether a planned architectural design can trigger or create potential for interesting forms of diversity within density, analogue to the *unpredictable and appealing diversity* that proliferates within dense urban areas. The Big Building will thus be used in our design studies as a laboratory of exploration of such principles and as an opportunity to question a possible *new discipline* that is neither architecture nor urbanism. What are in the end the specificities of Bigness? Up to which point can we really contemplate the possibility of planning a city structure within a building? How can we find guidance to conceive such a complex architectural/urban device?

Is it enough to bring people together to make a group? Is it enough to put together an extensive assortment of dwelling sizes, typologies and categories to stimulate social mix? The answers to these initial questions remain unanswered past our analysis, and yet typological mix seems to be a real trend in today's collective housing design, relating closely to the subject of social mix[3].

There's indeed a general belief that spatial proximity holds the power to reduce social differences[4], and that therefore different juxtaposed dwelling types may also represent opportunities for different social standards to mix and cohabit harmoniously within the same building/neighbourhood - a seemingly effective strategy to avoid the phenomena of social segregation. At the same time, our society is increasingly heterogeneous and changeable - *"the idealism of a former*

2 MVRDV, *Far Max – Excursions on Density*, 010 Publishers, Rotterdam, 1998, p. 535.

3 See *B*runo Marchand's observation in *B*runo Marchand, Christophe Joud, *Mix: Mixité Typologique du logement collectif – de Le Corbusier à nos jours*, PPUR, Lausanne, 2014, p. 5 "(*…) il n'a jamais été autant question de diversité et, en corollaire, d'individualisme dans l'architecture du logement.*".

4 See *F*rançoise-Hélène Jourda «Diversifier l'habitat pour rapprocher différents modes de vie» in *AMC MIX(CITE) Villes en Partage,* éditeur AMC, 2012, p.17: "*Une véritable mixité des typologies de logement correspondant à des modes de vie différents et pas seulement à des quotients familiaux, permettrait-elle de créer un « engrenage » de mixité sociale*?".

generation is confronted with new demands for individualism, protection and differentiation"[5] - and therefore a wide variety of dwelling types must be provided in order to respond to a wide range of individuals and family types[6]. Julien de Smedt enhances this idea of social *diversity* as a *desired* condition - "*We live in a world where individualism has a greater resonance than before. Diversity is well accepted, even desired. People living in a housing project must also have access to individuality*"[7]. On the other hand, the character of the traditional home becomes diffuse, as one can live in several different house types throughout life. MVRDV exaggerates this idea, stating that *"the house has become part of our 'dwelling-career' with the longing for diversity seemingly paramount: everyone should have lived in a loft at one time, in a house on the lake, in a squat, a bungalow, a commune, alone, with kids… The demand for a greater variety and even more extreme dwelling forms is gaining momentum. The ideal home doesn't exist anymore; there are thousands of ideal homes. The permanent ideal has been supplanted by the temporary*"[8].

The seminal housing project of MVRDV illustrates this nearly obsessive quest for typological mix. Berlin Voids looks like a Tetris of 284 ideal homes – an exacerbation of Le Corbusier's typological mix – dwelling units with different shapes and organization – shaped for this heterogeneous and unpredictable society. The buildings Silodam and El Mirador have been the clearest chances for MVRDV to effectively materialize and test this concept of typological diversity.

The base aim of the typological mix strategy is the one that, asides providing dwelling diversity, seeks for strategies to generate a sense of community, neighbourhood, forced conviviality, and also often aiming to translate the qualities of individual villas into collective housing schemes – aims that seem in many points very similar to the ones we have seen in Chapter I, linked to the work of the Smithsons and the Team 10.

individuality vs. togetherness

The sense of individuality and privacy that is proper to the individual villa is also a base premise on the planning of the collective housing building. Indeed, Monique Eleb and Jean-Louis Violeau insist on the idea that no form of social mix can be established without an effective protection of the sense of privacy and intimacy, associated, in the right balance, with a sense of togetherness.

The social interaction and the neighbourhood events are supposed to occur in the 'in-between' spaces: the corridors, the courtyards, the exterior terraces or the multiple varying names that often mix architectural and urban terms (the 'corridor street', the 'inner courtyard', the sky-plaza, etc.). And of course the spatial and

5 MVRDV, *KM3: Excursions on capacities*, Actar Publishers, *B*arcelona, 2005, p. 1008.

6 See *B*runo Marchand, Christophe Joud, *Mix*, *op. cit.,* p. 5: *"(...) l'habitant type n'existe plus et le modèle de structure familiale reconnu comme dominant dans le second après-guerre – un couple et deux enfants – ne represente plus qu'un segment peu significatif de la société."* .

7 Source: https://en.wikiarquitectura.com/index.php/VM_House (28/06/2016).

8 MVRDV, *FARMAX: Excursions on Density*, 010 Publishers, Rotterdam, 1998, p. 561.

tectonic definition of those architectural elements must be planned thoroughly – when they are to small/too narrow, they do not invite people to stop and stay; if they are too broad, they will probably keep people acting as strangers. Yet, when these spaces are carefully planed and eventually include green elements or exterior furniture, they invite the inhabitants to stay and use these spaces as if these were shared 'outdoor living rooms' that could potentially be used for events as well. We have seen that this principle explored at MVRDV's Parkrand, where the exterior gardens, planned strategically to offer protection from rain and wind, include also soft furniture, decorative walls, plants and chandeliers. Similar features can also be seen at MVRDV's El Mirador, with its 'viewpoint/garden in height' bearing a soft playground floor and multiple circular seating areas. Initially planed to be more than a terrace for the building's inhabitants, but to be used as a public space in height (we have mentioned the related issues earlier), this building wished to be a step-forward on the exploration of social interaction, including public users and opening the building to the city. A different terrace strategy is the one observed in the Celosia building, with the alternation between solid volumes of the apartments and the open terraces may suggest an approach that focuses more on the creation of several small common spaces, as much as helping to ensure the quality and individuality of the dwellings. We have seen how Monique Eleb and Jean-Louis Violeau have highlighted the importance of ensuring privacy and strategically planning the 'in-between' areas. They suggest that the terraces, functioning as threshold areas, can also express some differences in terms of social category – they claim that this could be more effective on the social 'stimulation' than the annulation of differences.

the street-house relationship

The 'interior-street' is a recurrent theme again in todays housing strategies, and it can be seen both at the Silodam and at El Mirador (with particular width, color treatment, often also skylights) that seem to wish to become neighbourhood 'places', compensating the scarcity of exterior terraces for the first case, enhancing the idea of inner network in the second. Very similar 'streets' can be seen also at BIG's VM houses, which is also a declared reinterpretation of the Unité d'Habitation in terms of typological variety and the treatment of the interior streets (with light on both ends, so as to avoid the dullness of the *Unité d'Habitation's* interior street).

physical and visual connection

A different and more innovative approach is the one seen in BIG's 8 Tallet housing building. Its author, Bjarke Ingels, claims to have built the model of 'street in the air' that the Smithsons explored in the past: "*The Smithsons tried to realise this and I think they never really succeeded*"[9]. Without seeking for verification, one must recognize that there's something thrilling and innovative on the fact of managing to integrate a town street (with realistic size and pavement) on the design of such a large-scale building, and mainly the fact that this street links the circulation system of the building to the actual ground of the urban space. The multiplicity of uses

9 Source: https://www.dezeen.com/2016/02/03/big-8-house-robin-hood-gardens-smithsons-streets-in-the-sky-failed-says-bjarke-ingels/

within the complex (housing, retail, offices) is linked by an elevated street that covers the entire building, from the ground to the upper levels. We must highlight the successful feeling of neighbourhood generated by this building, despite its large scale.

Moreover, the overall views of the building that a user can enjoy from any these spaces must be highlighted, as well as a general feeling of visual integration and connectedness that is felt at Parkrand and Celosia, and yet isn't felt for at the Solidam or at el Mirador.

Although we haven't focused particularly on the inner qualities of the dwellings for each building, we must highlight the thoroughness that is revealed on their planning as a general common point to all the above-analysed buildings, and their innovative strategies to deal with the high density challenge. The dwelling units are mostly well proportioned - well lit 'through' apartments planned strategically in order to avoid vis-à-vis issues. The 8 Tallet building bears again an innovative feature, which is the one of replicating the terraced house model (with its two floors, a small garden creating a buffer between the street and the home door), all of them accessed directly from the sloping street. At el Mirador, a series of triplex apartments have direct access to private sky gardens – a dwelling variety that is surprising in such a dense housing scheme.

04

Case-Study Analysis

4. Case-study analysis Introduction

Whereas, in the first chapters of this thesis, our aim was to understand the conditions and the evolution of the Big Building within a theoretical and historical framework, at this point, our intention is to explore real examples of Big Buildings that have recently attained completion, and to analyse them by means of an in-depth approach focused on the context, the design conception and the overall process. Among an extended database of possible Big Buildings containing housing, we have selected three main case-studies.

The first one, *De Rotterdam* is located in Rotterdam, NL, and has been conceived by OMA/Rem Koolhaas between 1997 and 2013. This building was our initial choice for it is said to embody the theoretical principles of *Bigness*[1]. Bearing an austere and generic envelope, the building claims to act as a counterpart to downtown Rotterdam, wishfully becoming a catalyst for the regeneration of the old port of Wilhelmina and the entire Kop van Zuid area. With a sheer size of 162'000 m^2, the 150m high rise building is described by the authors as a 'vertical city'. This enormous building, made of three interconnected towers, claims to embody both clarity (through the 'sense of uniformity' of its volume) and synergy between the different spaces, bearing declared influences from the massing and functional hybridity of the American skyscrapers[2]. This Big Building includes 21,6% of luxury housing, mixed with offices, hotel, commerce, activities and parking.

Our second case study, the Entrepôt Macdonald, is located in the French capital, in the urban sector of Paris NordEst - a zone that has been enduring large urban operations during the last couple of years - aimed at regenerating this part of the city. Within its total area of 167'000 m2, this building accommodates predominantly housing (50% of the whole building), half of it representing social housing, distributed along varied typological schemes. The building is confined within a unitary object shape – a reconversion of the large pre-existing warehouse - and is said to seek the reconciliation between the city of Paris and the principles of the 'urbanisme sur dalle' through the 'masterplan' initially designed by OMA/Floris Alkemade in 2008. Yet, as we will see, and due to multiple external factors, the building has turned into a juxtaposition of multiple different small buildings designed by 15 different architects, each one having its own individual entrance directly from the street. Its length of 600 m lends it the character of a 'horizontal skyscraper' and a potential upcoming symbolic weight as a landmark.

---

1 Having gone through a long period between conception and completion (1997-2013, due to political and economical reasons), the initial planning of de Rotterdam started shortly after Rem Koolhaas's publication of the Bigness theorem and the book S,M,L,XL, embodying possibly, in its design and in its unitary gigantic building shape, most of Koolhaas's thoughts on the matter

2 "*However it is true that New York alerted me to some of the potentials of vertical organisation and to some extent this has informed this building. The massing of De Rotterdam would be unthinkable without the buildings of such architects as Wallace Harrison. The Rockefeller Center, to name one example, also shares the sense of uniformity, which is a key element in De Rotterdam.*" *in* Andrew Mackenzie, "Batik, Biennale and the Death of the Skyscraper - Interview with Rem Koolhaas", *The Architectural Review*, 24 February 2014.

Our third case-study, The Interlace, in Singapore, was designed by OMA/Ole Scheeren between 2007 and 2013. It bears an amalgamate of volumes that articulate both vertical connections and the horizontal interlocking blocks. Each being six stories tall, the blocks are stacked in a hexagonal arrangements around eight generous courtyards - recalling some of the Megastructures published in Reyner Banham's catalogue[3]; these have declaredly served as reference to Rem Koolhaas and Ole Scheeren. With a sheer size of 170'000 m^2, this building contains the lowest functional mix of the three, and yet the highest percentage of housing, with the most intense exploration of typological diversity within a coherent scheme. The particular configuration of this building results on an extensive network of private and shared social spaces that are aimed at activating the spirit of a village and community life in a context of hyper density.

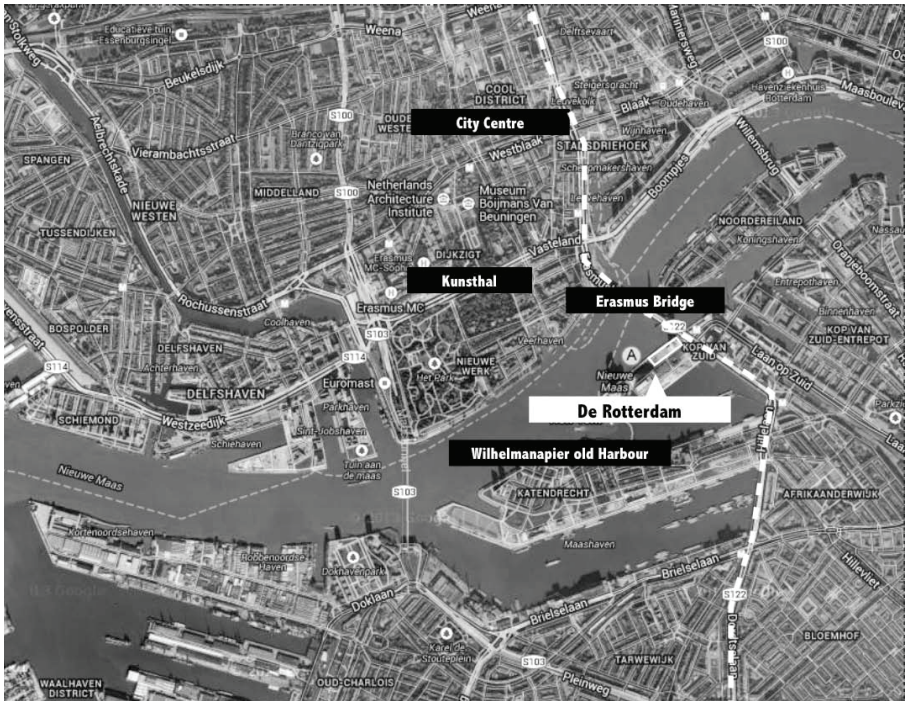
Our three selected examples illustrate three different formal models bearing a similar built surface – a 'vertical city', a horizontal 'city within a city' and a compound 'megastructural' scheme. Although this hasn't been a fundamental criterion for the selection, we find it interesting that our three core case-studies have the signature of OMA/Rem Koolhaas (though in collaboration with other architects) who, for each model, has collected influences from different historical architectural models and formulated reference theoretical works. The three buildings bear also clearly different approaches to the subject of housing in the Big Building, allowing us to raise different questions and hypotheses at each time. It was not our intention to select Big Buildings that were fully exemplary nor considered 'ideal' models of Housing in the Big Building, but rather to find examples that, on the one hand, could relate to the theoretical content of our research, and, on the other hand, become potentially consistent bases for the development of our design strategies.

3 Reyner Banham, *Megastructure: urban futures of the recent past*, New York, Harper and Row, 1976.

Case - Study 1

De Rotterdam

"The Vertical City"



Aerial View, ***The Interlace***, 2016
Source: Google Earth

Histotrical photos of Whilhelmina
Source: courtesy © MAB Development

1.
De Rotterdam, OMA, NL
1997-2013

1.1. Site and Historical Background

De Rotterdam is a massive solid block standing at Rotterdam's old port of Wilhelmina. The building, conceived by OMA between 1997 and 2013, is said to be the 'eye-catcher' piece amidst the set of signature buildings erected at this historical port[1].

Currently known as "*the architectural hotspot of Rotterdam*"[2], the site of Wilhelminapier bears a relevant historical weight in the city, as by the end of the 19th century and the beginning of the 20th century, hundreds of thousands Europeans migrated from this pier to America by huge Holland America Line passenger ships[3] [images]. The historical weight of the site is so present, that the most outstanding of its buildings – De Rotterdam – has been named after one of these ships[4] .

During the second World War, Rotterdam was "*one of the hardest hit cities in the Netherlands*"[5]. "*The bombing of 14 May 1940 destroyed 24,000 homes, 2,400 shops and another 4,000 buildings, almost wiping out the entire city centre*"[6] and the town has been through an almost complete reconstruction since then.

In an interview for *The Architectural Review*, Rem Koolhaas emphasizes the specific historical conditions of the site: "*The site on Wilhelmina Pier is obviously deeply historical. (…) So yes, context is very important in relation to this building. Of course only 60 years ago Rotterdam was effectively a three-kilometre crater of nothingness in the centre of the city. This has created a unique situation, where now the periphery is old and the centre is new. Contrary to many other cities across Europe that simply had*

1 "*Despite—or maybe because of—having taken the longest to complete, OMA's De Rotterdam is clearly the king of this architectural jungle. It is 350 feet wide, 490 feet high and 118 feet deep. Its almost cartoon-like rendering of blocks does not alter the fact that it has something else, which you could call class. It has authority and presence without stridency.*", *in* Hugh Pearman, "Bringing XL back home", *Architectural Record*, March 2014, Vol. 202, Issue 3, p. 108.

2 There is a website dedicated specifically to the Wilhelmina Pier and its multiple architectural and leisure attractions. See more here: http://www.wilhelminapier.nl/en/architecture/ (03/07/2016).

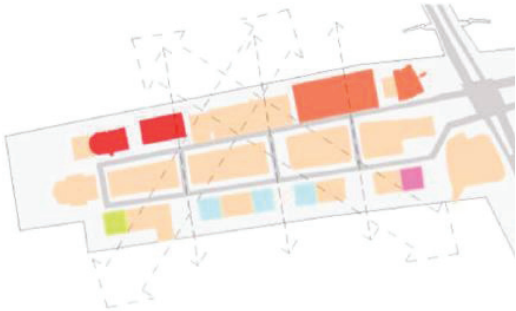
3 Source: http://www.cityguiderotterdam.com/er-op-uit/bezienswaardigheden/wilhelminapier-rotterdam/ (03/07/2016).

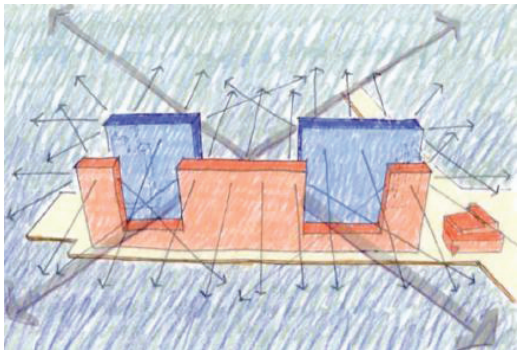
4 "*Le 3 septembre 1959. Un paquebot nommé De Rotterdam quitte le port de Wilhelminapier et effectue son premier service transatlantique. Propriété de la compagnie Holland America Line, il transporte des milliers d'émigrants européens vers les Etats-Unis.*" *in* Marta Brandao, Nelson Vera-Buechel, "De Rotterdam ou la théâtralisation de la densité", *Les Cahiers de l'Aspan*, November 2014, p. 11 (pp. 10-15).

5 Information extracted from *Timeline: 75 milestones from 75 years of reconstruction.* Source: http://www.rotterdamviertdestad.nl/media/1725/rvds-factsheet-web-eng.pdf (03/07/2016).

6 *Ibidem.*

Masterplan Kop van Zuid, Teun Koolhaas 1987
Source: courtesy © MAB Development





Masterplan of Whilhelmina, Renzo Piano
Source: courtesy of MAB Development

to repair things that still existed, Rotterdam had to start from scratch. This explains why Rotterdam is the city of architects, because there was so much work to be done after the war. It is also the reason why Rotterdam is, for a modest-sized city, a city of large scale"[7].

With the reconstruction being initially focused on the old city centre of Rotterdam, the whole area of the Kop van Zuid has had no relevant intervention until 1987, when the architect Teun Koolhaas[8] (1940-2007) designed its masterplan. This redevelopment envisioned the transformation of the Kop van Zuid – by then an outdated harbour area - into a ravishing new urban area, nearby the city centre of Rotterdam[9]. Its final Masterplan and zoning plan has been established in 1991.

Being the most prominent part of the whole Kop van Zuid area, the old port of Whilhelmina has had its own masterplan conceived in 1993 by Foster & Partners, who were also the designers of one of its first built projects (1995-2000) – Toren op Zuid –, a 32 story and 124m high office building (the headquarters for the Port Authority). The redevelopment of Wilhelminapier, proposing several dense high-rise buildings, has ultimately been added of a series of other outstanding residential and office buildings designed by Renzo Piano (1997-2000), Mecanoo (1999-2002), Álvaro Siza (2007-2010), amidst many other celebrated architects. Altogether, the Erasmus Bridge, the Cruise Terminal, the New Luxor Theatre, Montevideo, the World Port Centre, Las Palmas, the South District Tower and Hotel New York, New Orleans and finally, De Rotterdam, have consolidated the exceptional image of the new Wilhelmina Pier [see diagram in the next page].

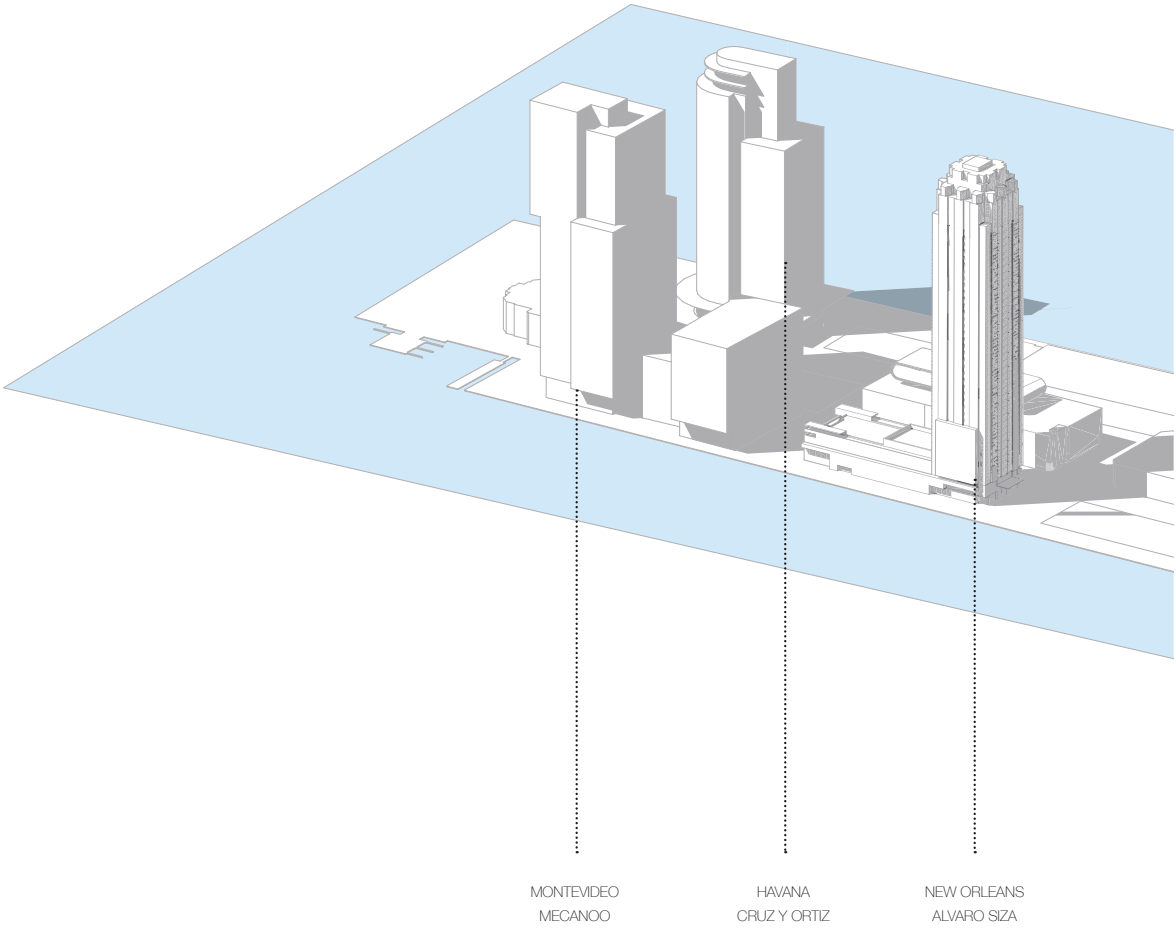
Today, the port of Wilhelmina is indeed one of "the architectural front pieces of the Netherlands", with its multiple references to Manhattan and the intrinsic scale, density and design of its buildings bearing a surprising contrast with the flat landscape of the Netherlands, a country where mass housing has ever since been planed according to the precepts of "low-rise, high density"[10]. Indeed, the Whilelmina Pier looks like a small piece of Manhattan grafted into Rotterdam, as if part of what had left the port to America, in the past, had returned with amplified strength to invigorate the city. The multiplicity of ancestral warehouses and iconic new buildings aspires indeed to "*compete with the cosmopolitan port quarters of*

7 Andrew Mackenzie, « Batik, Biennale and the death of the skyscraper. Interview with Rem Koolhaas », *Architectural Review*, February 2014.

8 Teun Koolhaas (7 January 1940 in Singapore - 3 October 2007 in Amsterdam) was a Dutch architect and urban planner. Koolhaas worked on the master plan for the new city of Almere, and was responsible for its urban design. In the mid-eighties Koolhaas started out on his own, and founded Teun Koolhaas Associates (TKA). TKA's work included the master plan for Kop van Zuid in Rotterdam.

9 Lecture by John Westrik, Expert in Urban Design, Department of urban planning, housing and traffic Municipality, city of Rotterdam, May 2005. Source: http://ifou.org/summerschool/2009delft/lectures/05_ifou_summerschool_2009.pdf (03/07/2016).

10 Lecture by Nicolas Pham, "Housing and urban planning in the Netherlands: The virtue of necessity" held at the Complex Design Seminar *De Rotterdam: Exploring the Vertical City*, on the 4th of July 2014 in Rotterdam. See also Jelte Boeijenga, Jeroen Mensink, *Vinex Atlas*, 010 Publishers, Rotterdam, 2008.



Influence Area: Rotterdam, NL

Insertion in the Grid: Kop Van Zuid Masterplan

Funds: Private (with statal support)

Completion: (1997-) 2013

Height: 150 m

Stories: 45

Plot Area: 5'589 m2

Gross Floor Area: 162'000 m2

Floor Area Ratio: 26.21

Covered Area: 100%

Use: Residential, offices, commercial, cultural, hotel, parking.

Developer: MAB; OVG Projectontwikkeling

Architect: Office for Metropolitan Architecture

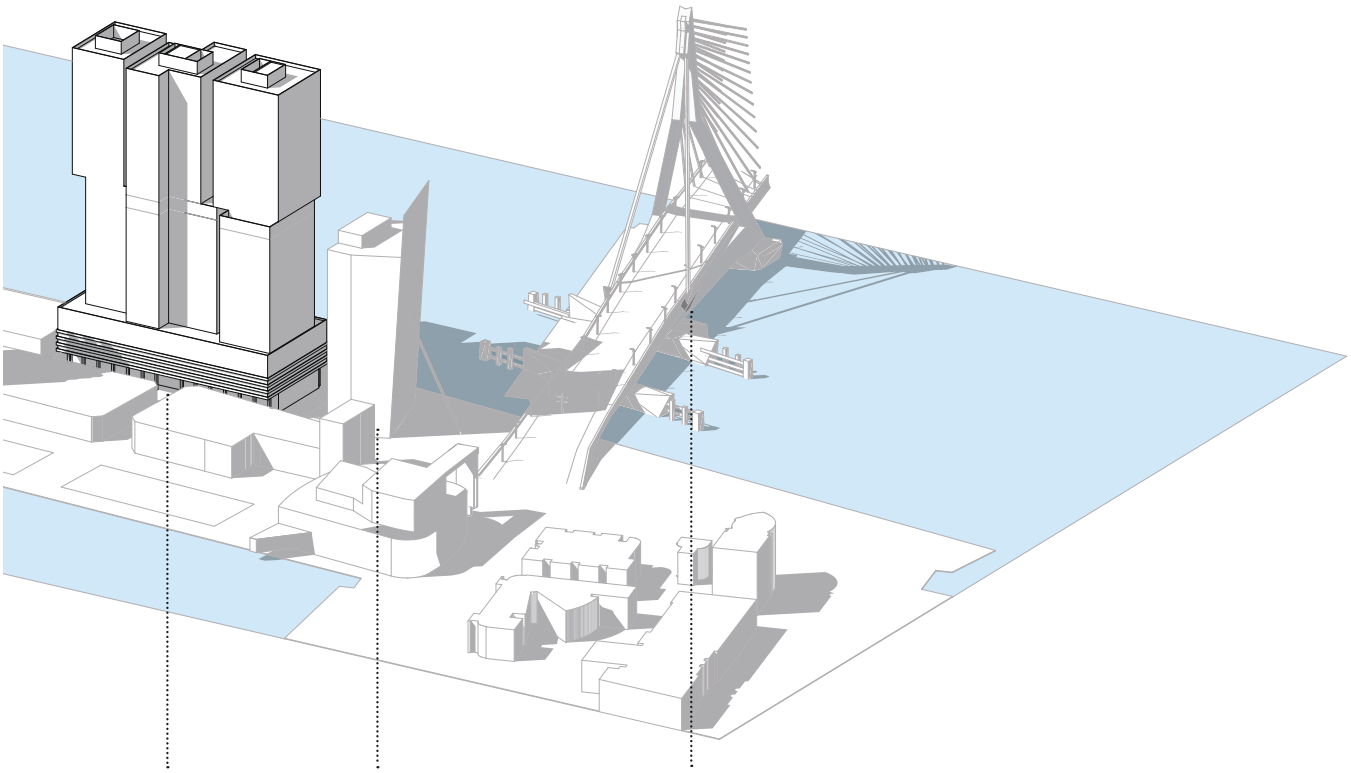
Structural Engineer: Corsmit Raadgevende Ingenieurs

MEP Engineer: Techniplan Adviseurs; Valstar Simonis Project

Manager: De Rotterdam CV; DVP

Main Contractor: Zublin

Other Consultants: ABT Delft (code); Arup (structural advisor at schematic stage); DGMR Raadgevende Ingenieurs (acoustics, wind); Permasteelisa Group (façade); TGM (façade)

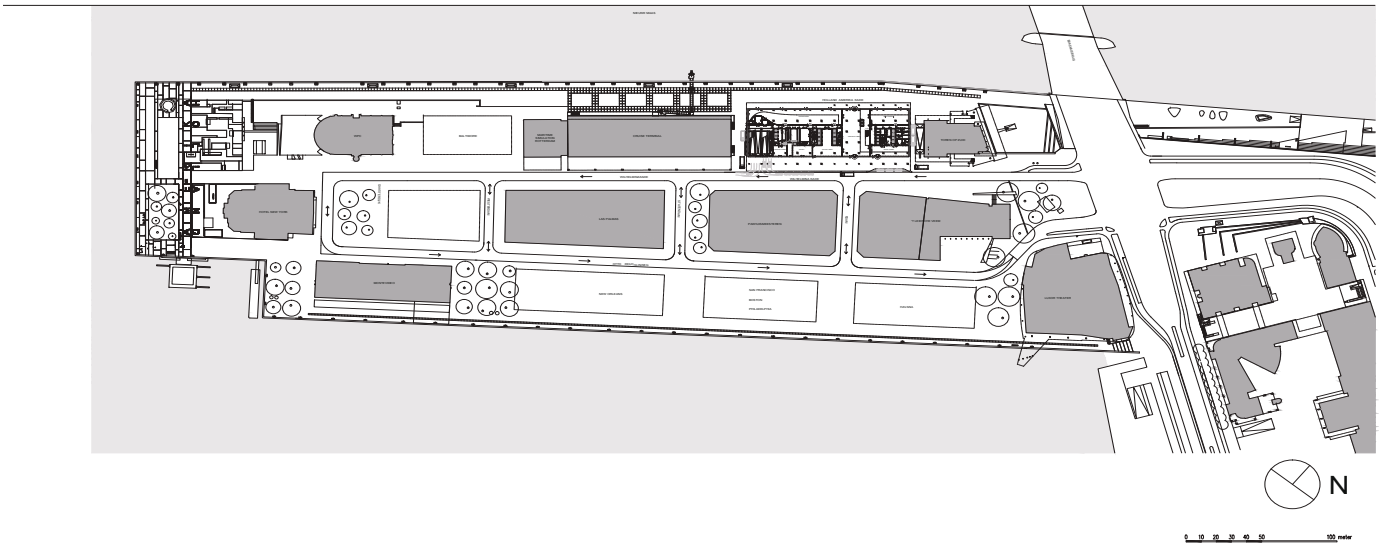


DE ROTTERDAM
OMA

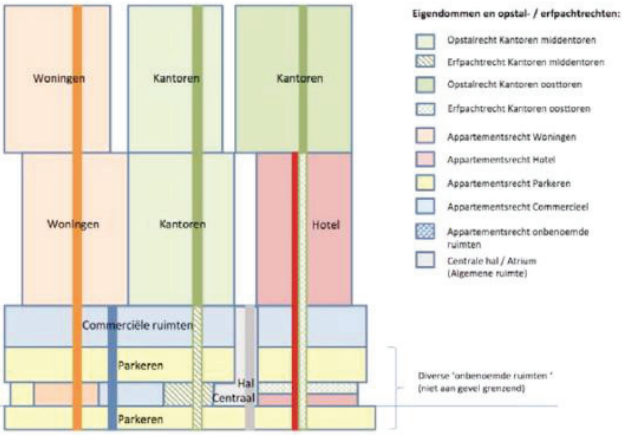
KPN TOWER
RENZO PIANO

ERASMUS BRIDGE
UN STUDIO

Diagram made by the author



Site Plan: courtesy © OMA



De Rotterdamv Property Diagram
Source: Courtesy of Karen Quist

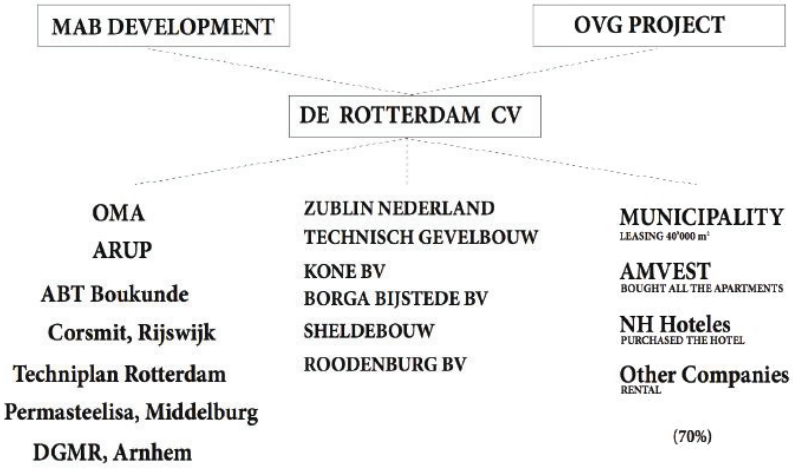


Diagram of Stakeholders
Source: Author Diagram

Sydney, London and New York"[11] while reminding us of its past through a series of different elements: many docks and streets named after American cities or HAL ships and a district still packed with all kinds of maritime objects[12].

1.2. De Rotterdam – Process

The project of De Rotterdam went through a stop-and-start 17-year gestation, from 1997 to 2013. It started with the creation of the join venture De Rotterdam CV, gathering MAB Development (from The Hague) – a developer experienced in large scale and mixed use projects, namely the Almere Project (1994-2005) by OMA - and OVG Projectonwikkeling (a local developer from Rotterdam).

"The FGH Bank is the financier of this project and a total of 7 different contractors have been involved in the process: Züblin Nederland (construction), Roodenburgh Installatie Bedrijf (installations), TGM and Scheldebouw (façade), Kone (lifts), Eneco (heating/cooling), and SBB (hotel finishing)"[13], all working in coordination with the project team from OMA, led by Rem Koolhaas, Ellen van Loon, Reiner de Graaf and the project manager Kees van Casteren.

De Rotterdam CV, the developer, led by the project manager Mischa Molsbergen, has been the entity responsible for the coordination of the work of the multiple stakeholders, not only the ones working on the project/construction, but also in the financial model and legal procedures inherent to the process.

The estimated cost of 375 million euros was a far too high value to be endured by a private company alone, and this has forced De Rotterdam CV to search for other companies and investors, envisioning the establishment of a sustainable financial model. Although a group of investors has ultimately agreed to finance the project, in order to make the construction of De Rotterdam possible, the developer has been assigned the challenging task of finding entities available to sing leasing or selling contracts for 70% of the building, and this, 4 years before the costruction.

The Housing block on the West Tower has been sold to the investor AMVEST that would be in charge, as an independent entity, of promoting and selling all the apartments at De Rotterdam. The leasing of the hotel has been arranged with the company NH Hotels. Finally, a leasing contract has been established with the municipality that agreed on moving part of the administration offices to De Rotterdam.

The developer didn't own the site of De Rotterdam either. The possibility of building De Rotterdam on this particular site has also been achieved through a special agreement with the municipality. As per the words of Mischa Molsbergen,

11 Source: http://www.wilhelminapier.nl/en/architecture/ (03/07/2016).

12 Source: http://www.cityguiderotterdam.com/er-op-uit/bezienswaardigheden/wilhelminapier-rotterdam/ (03/07/2016).

13 Source: http://www.derotterdam.nl/en/news/de_rotterdam__vertical_city_by_oma_rem_koolhaas_completed/ (03/07/2016).

De Rotterdam and the Wilhelminapier, "the architectural hotspot of Rotterdam"
Credits: © Ossip van Duivenbode

"*the choice of Rem Kolhaas (OMA) as the project architect - the most recognized architect in the Netherlands - has been a strategy to get the immediate support of the municipality*"[14]. Indeed, having built XL buildings in many powerful Asian metropolises, *bringing XL back home*[15] could also mean to bring part of that Global vigour to the Dutch city. An agreement with the municipality has ultimately been established, allowing the developer to get the rights (leasehold) to build on the site and to purchase the land only after the completion of the building.

The political endorsement of De Rotterdam

Some polemical observations have been addressed to the financing model of this building in several articles[16]. Although De Rotterdam is a speculative and luxurious project (and, a priori, a private development), its realization has only become possible thanks to a substantial contribution of public financing; moreover, getting users (the public entity) for De Rotterdam implied emptying other office buildings, in a city where several office buildings were already abandoned.

On the other hand, though, the immediate political engagement and financial support given to this project is understandable, as De Rotterdam may withstand an important potential to the whole city of Rotterdam as a new landmark and as a motivator of new dynamics. By adding this new building to its 'architectural portfolio', Rotterdam undoubtedly strengthens its position as a city, joining the network of global cities[17] with powerful economic vigour. Architectural objects such as De Rotterdam represent a major interest for cities and regions as they acquire a symbolic structuring role on the urban space, contributing, with their functional diversity, for the activation of the area in which they are located. Moreover, they create value and cash effects for many actors and many territories. The government seized the architectural 'capital' to reach a better territorial position, seeing these iconic buildings as a new form of economic attractiveness and a new form of public-private partnership.

Finally, De Rotterdam bears a declared quest for economic and financial performance, as it is based on the idea of 'architectural capital' - the building becomes an asset to the 'territorial capital' of a city at a global scale.

"Enfin, De Rotterdam relève d'une quête de performance économico-financière. Celle-ci se base sur le capital architectural et l'augmentation du capital territorial d'une ville à l'échelle globale comme c'est le cas de Rotterdam. Ce capital symbolique et

14 Lecture by Mischa Molsbergen, "De Rotterdam: The process of conception, construction and management", held at the Complex Design Seminar *De Rotterdam: Exploring the Vertical City*, on the 4th of July 2014, in Rotterdam.

15 Hugh Pearman, "Bringing XL back home", *Architectural Record*, March 2014, Vol. 202, Issue 3, p.108.

16 See, for instance, Oliver Wainwright, « Rem Koolhaas's De Rotterdam : Cut and Paste Architecture », *The Guardian*, November 2013. Source: https://www.theguardian.com/artanddesign/2013/nov/18/rem-koolhaas-de-rotterdam-building (03/07/2016).

17 See Saskia Sassen, "The Global City: Introducing a Concept", the *Brown Journal of World Affairs,* 2005. Web Source: http://www.saskiasassen.com/pdfs/publications/the-global-city-brown.pdf (03/07/2016).

De Rotterdam - study models
Source: Courtesy © Kees van Casteren/OMA

territorial se traduit concrètement en termes monétaires pour les investisseurs qui, grâce à une fragmentation fonctionnelle du bâtiment, peuvent se séparer (vendre ou louer) aisément des différents programmes construits. L'objectif des investisseurs serait ainsi de s'approprier une bonne partie de ces performances co-créées par le design architectural, la technique du bâti et le besoin de marketing des villes."[18]

Moreover, this iconic building claims to have the potential to be transformed over time thanks to its design based on the idea of an evolving 'interior flexibility' within a solid architectural envelope. This possibility of transformation would be said to guarantee the preservation of monetary value, efficiently responding to economic requirements for sustainable development and to the changing needs of uses and users across time. Koolhaas reinforces indeed this idea: "*We want our buildings to evolve. If you look back in history, you also see that almost any building is able to accommodate almost any kind of activity*".[19]

The permitting process

Same as for any exceptional building, the application for the building permit hasn't been a typical process (regardless the fact that the municipality declaredly endorsed the construction of this building). The building permit application has been made in two parts and the approval happened between 2001 and 2008. The separation of the building into different owners and tenants has also been a complex challenge due to the multifunctional organization of the building in height (many common areas in the lower levels are inescapably shared amidst all users), but the volumetric independency at the higher levels of the building (the three towers on top of the plinth) has helped assigning different areas to different functions. Karen Quist, Lawyer at MAB and responsible for most of the contractual procedure involving de Rotterdam, highlights the complexity of the building: "*in many ways, De Rotterdam represents an exemplary form of juridical complexity because of its mix of functions, multiple parties involved, mix of contractors, mix of users and mix of investors*"[20]. Indeed, the compactness of the building implies the formulation of complex property contracts, sustained by schematic drawings that define the fragmentation of the building among different owners, in which many access areas are shared or, in the particular case of this building, can even be public.

The architectural design of De Rotterdam

The project started in 1998. Different design strategies have been developed by OMA through an astonishing number of models produced during the concept design phase. The base form was a solid and compact block, having then evolved into a shape that looks like a conglomeration of towers on top of a podium [image]. "*The original 1998 design for De Rotterdam also contained a multiplex cinema in the*

18 Marta Brandao, Nelson Vera-Buechel, *"De Rotterdam ou la théâtralisation de la densité"*, *op. cit.*, p. 15 (pp. 10-15).

19 Paul Fraioli, "Reinventing the city: An interview with architect Rem Koolhaas", *CS Monitor*, July 2012.

20 Lecture by Karen Quist, "The juridical complexity of De Rotterdam: Multiple parties, mix of functions, contractors, users, investors" held at the Complex Design Seminar *De Rotterdam: Exploring the Vertical City*, on the 4th of July 2014 in Rotterdam.

De Rotterdam - construction images
Credits: © Ruud Sies

plinth and the facades were more differentiated. What is striking about the building is the overall impression of blankness. It is so blank, that it isn't even enigmatic any more. It is not spectacular either, despite its size. It just sits there.[21]. This generic aspect of the building's envelope may suggest the possibility for "*infinite variations contained within its basic legal shape*"[22], recalling Hugh Ferriss's illustrations.

As described by Rem Koolhaas himself, "*It started in the late '90s, working for developers who made continual adjustments to the programme mix of housing, commercial offices, hotel. So we decided that we needed something that could survive all those changes. We developed an idea around a group of independent blocks where each had a shifting relationship to the other. This generated a building with a richness of silhouettes as you move through the city*"[23].

The construction was initially supposed to start in 2001, yet the economical uncertainty that came along with the September 11 attacks has put the construction on hold. In 2004, the project was again close to start, yet the Dotcom crash has strongly affected the Netherlands and the resulting economic uncertainty has put the project on hold once again. After some other unconsummated potential starts in 2007 and 2008, and mainly due to the lowering of the construction prices as a consequence of the crisis, in 2009, the construction has finally begun.

The Construction Process

The challenges linked to the construction of De Rotterdam are mainly related to the restricted area available at the base. The land, having the approximate size of a football field, was expected to receive a 150m high building, which required a highly precise level of logistic planning. The works on the building site were worked with 'lock operation', within which the materials had to be delivered and processed immediately after since there was no area available for storage. The excavations for the construction have been done by ship as a way of preventing 800 trucks from driving through the city. Other superlatives apply to this building as, for instance, the number of construction workers – up to 800 on site at the same time. The construction drawings were over 40'000 and the number of spaces within the building exceeds 7'500.

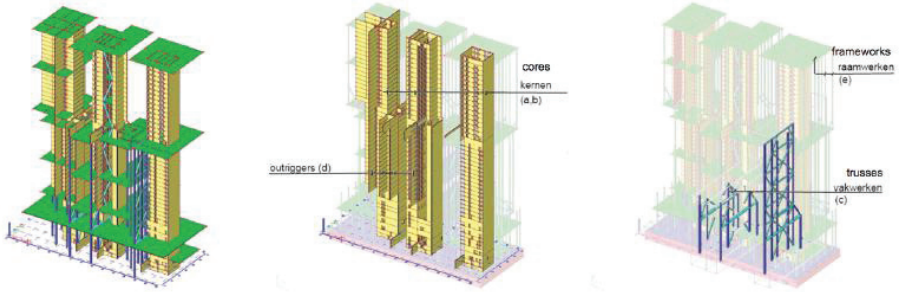
Yet, and despite the high risk and complexity that have always been inherent to this project, its completion has succeeded to the point of having been finished in less than four years. As proudly stated by its managers, "*the largest building under construction in Europe was completed within 4 years, according to plan and within the budget*"[24]. Mischa Molsbergen said that such unique achievement has

21 Bart Lootsma, "Blank Account: De Rotterdam, by OMA in Rotterdam, Netherlands", *The Architectural Review*, 24 February 2014. Web Source: http://www.architectural-review.com/today/blank-account-de-rotterdam-by-oma-in-rotterdam-netherlands/8659225.fullarticle (15/07/2016).

22 Rem Koolhaas, *Delirious New York*, *op. cit.* p. 114.

23 Andrew Mackenzie, « Batik, Biennale and the death of the skyscraper. Interview with Rem Koolhaas », *op. cit.*

24 Source: http://www.ctbuh.org/LinkClick.aspx?fileticket=IrJLQS%2Br6rc%3D&tabid=4810 (03/07/2016).



Jan Font Freide "The structural design of De Rotterdam"

been "*made possible by the professionalism and commitment of all parties involved*"[25] in the realisation of the project, and also by the fact that the team was composed by a relatively small group of people that were present during the entire process.'

Structure

The main structure of De Rotterdam is concentrated in the vertical cores and in columns distributed along an 8,1 m structural grid. The structural solution includes some extra elements for stability in plinth, intermediate technical floors, trusses, outriggers and transfer structure between middle and east tower[26]. The columns are mostly concentrated on the façade - and eventually the thickness of the columns becomes prominent in the apartments or in the hotel bedrooms, interfering with the space. Nonetheless, the scheme seems to be rather flexible adaptive to future transformations.

1.3. Density as a 'disguise': Grafting the American density into the flat context of the Netherlands

De Rotterdam, bearing approximately 162'000 m^2 of floor space on *a plot the size of just one football field*, is a building that questions the concept of density - "*On average around 5,000 people will be in the building on a daily basis. Aside from being the most densely built-up piece of land in the Netherlands, this will make it the most densely populated area too*"[27].

In the previous chapters, we have depicted Rem Koolhaas's thrill over the idea of urban density (or urban *congestion*) - the implicit theory at the base of the book *Delirious New York* [28]. Such fascination follows a belief that this form of density is meant to become "*a basis for a desirable modern culture*" [29]. Koolhaas goes even further and describes it as a potential new 'doctrine' that will eventually end up "*claiming its place among contemporary urbanism*"[30].

The concept of 'vertical city' that has indirectly informed De Rotterdam is clearly rooted in Manhattan's skyscrapers - mixed buildings "*with no assigned hierarchy*" [31], as the ones analysed by Rem Koolhaas in *Delirious New York*. These buildings do not obey to a specific typology. Instead, each part of the building is assigned to specific functions corresponding to what Koolhaas once described as the *vertical schism*: "*the freedom to stack such disparate activities directly on top of each other without any concern for their symbolic compatibility*"[32].

25 Source: http://www.derotterdam.nl/en/news/de_rotterdam__vertical_city_by_oma_rem_koolhaas_completed_ (03/07/2016).

26 Jan Font Freide "The structural design of De Rotterdam"
Source: http://www.vereniging-bwt.nl/upload/activiteiten/242/Jan_Font_Freide.pdf (01/08/2016).

27 *Ibidem*.

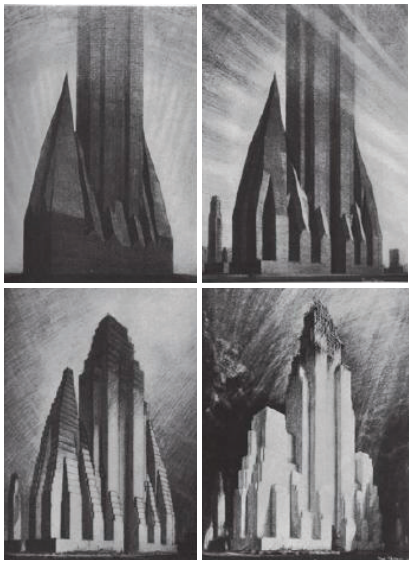
28 Rem Koolhaas, *Delirious New York*, The Monacelli Press, New York, 1994, p. 10.

29 *Ibidem*.

30 *Ibid*.

31 *Ibid*.

32 *Ibid*. p. 105.



Hugh Ferriss's drawings representing the mutation of the envelopes in American skyscrapers.
Source: Rem Koolhaas, ***Delirious New York***, 1978

Manhattan's architects perform 'The Skyline of New York' desguised as American skyscrapers
Source: Rem Koolhaas, ***Delirious New York***, 1978

The skyscrapers are thus pointed out as predecessors and valuable lessons for a series of complex new projects, bearing a similar multiplicity of uses and actors. This new possibility of functional fragmentation also proves to be attractive to investors, who can modify the surfaces assigned to each architectural program during the construction of the building, allowing them to diversify profits and risks.

The skyscraper is also identified as a predecessor of the concept of *hyper-density*– the concentration of a maximum amount of programs and individuals within a limited land area[33] - a phenomenon which, in Manhattan, has been triggered simultaneously by the rigidity of the grid and by the high land prices (the equation of the construction couldn't be but that of a *hyper-densification*).

By referring to the qualities of the Rockefeller Center or the Downtown Athletic Club, Koolhaas announces his vision on the concept of *density*: a dynamic new engine, structuring and strengthening, paradoxically, the attractiveness of the city: "*Manhattanism is the one urban ideology that has fed, from its conception, on the splendours and miseries of the metropolitan condition - hyper-density - without once losing faith in it as the basis for a desirable modern culture. Manhattan's architecture is a paradigm for the exploitation of congestion*."[34]

It is precisely this 'attractive side of urban density', proclaimed by Koolhaas in his Manhattan Manifesto that seems to have fed the design of De Rotterdam, partly using it to the service of a territorial marketing strategy[35].

Built density versus perceived density

Although De Rotterdam seems to architecturally succeed as a *doppelgänger* of an 'American hybrid' [see chapter 1], its immediate context is the result of a radically different urban scenario, exempt from the congestion that characterizes Manhattan. The normality that this building would bear in a New York context - where the urban fabric is an accumulation of 'Automonuments' - is highly contrasting with the exceptional nature that it acquires on the banks of the Meuse, despite the numerous tall buildings defining the skyline of the Wilhelminapier.

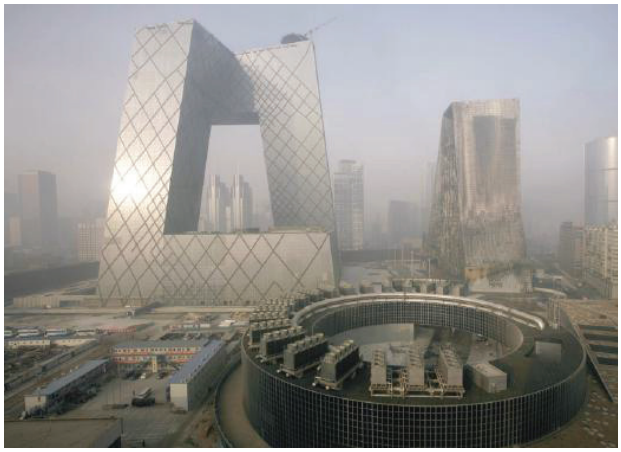
At the same time, and unlike the American example, De Rotterdam does not emerge from a real need for densification. On contrary, its realization is linked to a paradox mentioned above: that of having instigated the clearance of two towers of the center of Rotterdam to fill the office space with the administrative services of the city, which would be equivalent to saying, "*Let's build houses, because we need more people*"[36].

33 *Ibid.* p. 178.

34 *Ibid.* p. 10.

35 About this idea of Architectural Desguise, see Marta Brandao, Nelson Vera-Buechel, "De Rotterdam ou la théâtralisation de la densité", *Les Cahiers de l'Aspan*, November 2014, p. 11 (pp. 10-15).

36 Oliver Wainwright, « Rem Koolhaas's De Rotterdam : Cut and Paste Architecture », *op. cit.*



Shenzhen's new stock exchange building, OMA
CCTV, Beijing, OMA
Images: © Courtesy of OMA

Despite the verticality and the functional mix contained within the building, can we really speak of 'vertical city' or should we rather conclude that this term is used only as a marketing tool to endorse the urban and economic-financial performance of the operation?

All things considered, it would be fair to say that Rotterdam embodies a "transformed and transformative form of density" which is the result of at least three requirements of performance: a) the performance of the city in a 'global' context; b) the territorial performance (within the city of Rotterdam); c) the economic and financial performance (considering the financial outcomes of the building)[37]. This is an observation corroborated by Oliver Wainwright: "But take with a pinch of salt the architect's claim that it has built a "vertical city." It's a very large and imposing chunk of upmarket real estate, which is not the same thing. It is, however, large enough to command this flat, watery urban landscape and to shift one's perceptions of the city"[38].

Completed shortly after the CCTV in Beijing [image] and just before the Stock Exchange in Shenzhen [image], De Rotterdam seems to belong to this family of projects that produces a "new type of architecture". All three have common characteristics such as extraordinary scale, verticality, or the generic and independent architectural language context[39]. Yet, more than the other buildings, De Rotterdam seems to embody the five Theorems of Bigness [see chapter 1] in an exemplary way: 1. due to its scale, the building becomes a Big Building, "*no longer controlled a single architectural gesture*" and thus implying the autonomy of its parts (although these remain merged within a whole); 2. the elevator establishes mechanical rather than architectural connections inside the building; 3. the exterior façade does not reveal what happens inside the building; 4. through size alone, the building becomes an 'Automonument'; 5. "*Together, all these breaks-with scale, with architectural composition, with tradition, with transparency, with ethics-imply the final, most radical break*": the break with the city or any kind of context.

1.4. The Functional Mix

As per OMA's descriptions, "*De Rotterdam is conceived as a vertical city: three interconnected mixed-use towers accommodating offices, apartments, a hotel, conference facilities, shops, restaurants, and cafes*"[40]. The building contains *60'000 m² of office space, hospitality and catering covering around 1'500 m², a four-star lifestyle hotel with conference and event facilities and 280 rooms, a car park with space for 670 vehicles, 240 apartments and leisure facilities*[41].

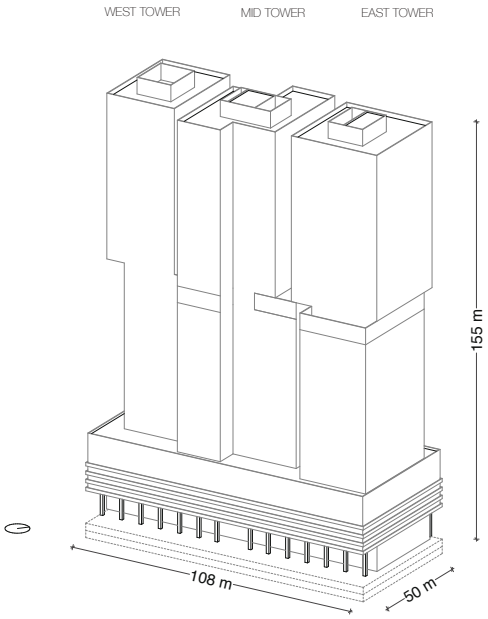
37 See Marta Brandão, Nelson Vera-Buechel, *"De Rotterdam ou la théâtralisation de la densité"*, *op. cit*., p. 15

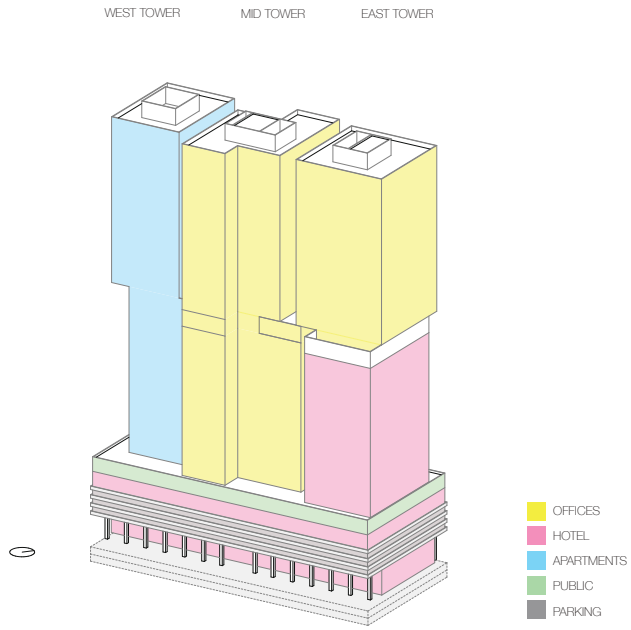
38 *Ibid.*

39 Marta Brandão, "Variations sur le thème de la complexité à grande échelle", *Revue Tracés* n. 07, April 2014, pp. 10-16.

40 Project Description by OMA. Source: http://oma.eu/projects/de-rotterdam (01/07/2016).

41 Source: http://www.ctbuh.org/LinkClick.aspx?fileticket=IrJLQS%2Br6rc%3D&tabid=4810





Images: Diagrams made by the author

The three towers of De Rotterdam are arranged as pieces of a *subtly irregular cluster that refuses to resolve into a unitary block*, and thus triggers changing perceptions of the building when observed from different viewpoints (an aspect that is particularly noticeable when one perceives the building in motion from the Erasmus bridge). "*The towers take a straightforward approach to separating distinct programs into distinct blocks, yet attain an interesting diversity through their slightly irregular forms and interconnectedness*"[42]. Nonetheless, the façade treatment of the building is one of a monolith, hiding its mixed-use character beneath an apparent uniformity. Only at night, the twinkling of the interior lights eventually denounces the *different programs and lends dynamism and animation to the façade, contributing to the humanization of the monolith*[43].

The West Tower is fully occupied with apartments, the Mid Tower contains offices and the East Tower contains the Hotel at the bottom half of the tower and offices at the top half of the tower [see diagram]. The first six floors of the building - the plinth - host the uses that are shared by the building's users (lobbies, restaurants, commercial and cultural activities) and are also open to public users. The public floors have higher floor heights and there are also slight floor-height differences between the housing, offices and hotel areas (yet these are not sufficiently big to be noticeable). The diverse programs of this mixed-use building, similarly to an "*urban complex, are organized into distinct blocks, providing both clarity and synergy: residents and office workers alike can use the fitness facilities, restaurants, and conference rooms of the hotel. These private users of the building have contact with the general public on the ground floor, with its waterfront cafés*"[44].

The building includes a public square at the ground level – named *Rotterdam Square* –, which, despite being an interior, controlled and acclimatized space of the building, is legally a public square belonging to the city[45]. The "*ceiling height of 8.5 meters, ensures a smooth transition between exterior and interior*"[46] and allows for visual connection between the street and the waterfront. Located past the building's 'main door', this square is particularly interesting, reinforcing the Big Building's potential as a real container of urban elements. However, the interior dynamics that could be expected to evolve from this public space upwards are rather deceiving, as the accesses to the different uses (lobbies for different activities)

&language=en-GB (01/07/2016).

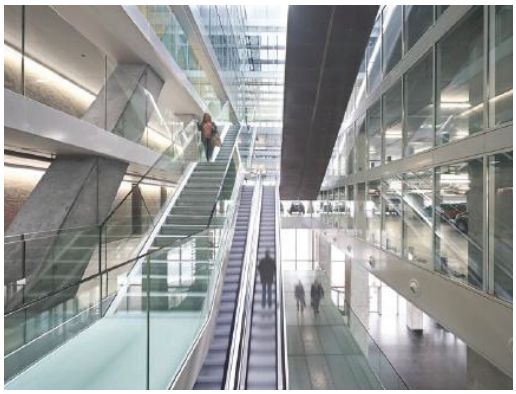
42 Best Tall building in Europe - Jury Statement. Source: http://www.ctbuh.org/LinkClick.aspx?fileticket=bGJLWml0juw%3D&tabid=6853&language=en-US (15/07/2016).

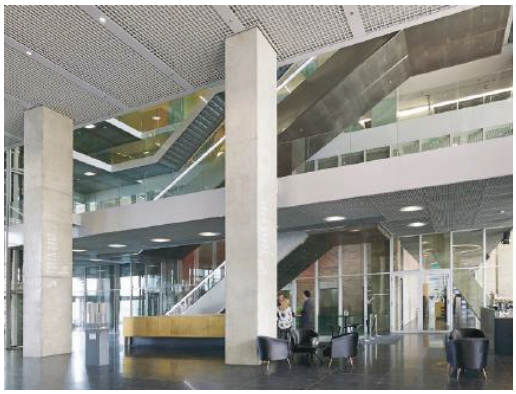
43 Source: http://www.ctbuh.org/LinkClick.aspx?fileticket=bGJLWml0juw%3D&tabid=6853&language=en-US (01/07/2016).

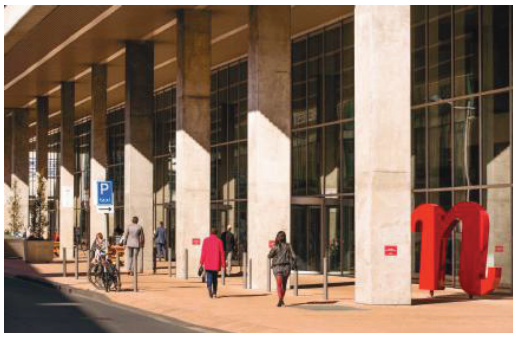
44 Detail Online. Source : http://www.detail-online.com/article/vertical-city-de-rotterdam-mixed-use-building-16632/ (15/07/2016).

45 Lecture by Karen Quist, "The juridical complexity of De Rotterdam: Multiple parties, mix of functions, contractors, users, investors" held at the Complex Design Seminar *De Rotterdam: Exploring the Vertical City*, on the 4th of July 2014 in Rotterdam.

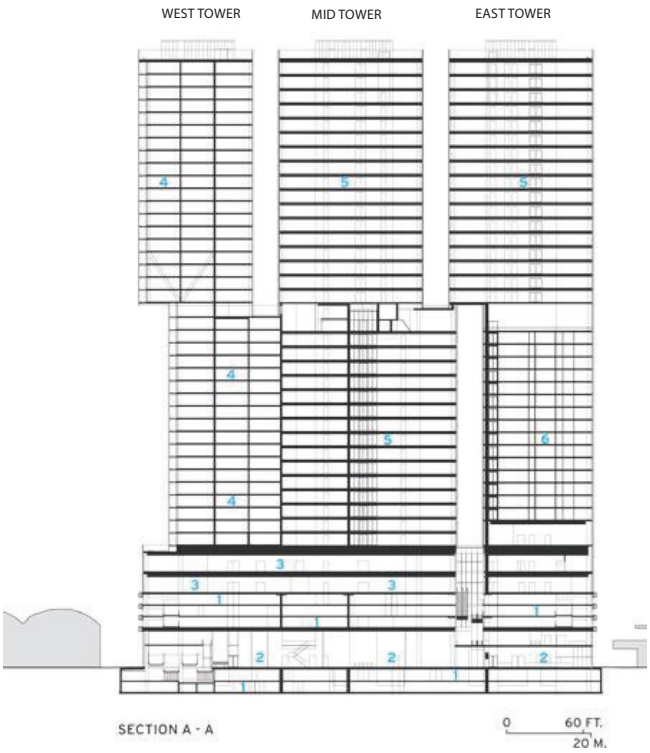
46 Source: http://www.ctbuh.org/LinkClick.aspx?fileticket=bGJLWml0juw%3D&tabid=6853 (15/07/2016).





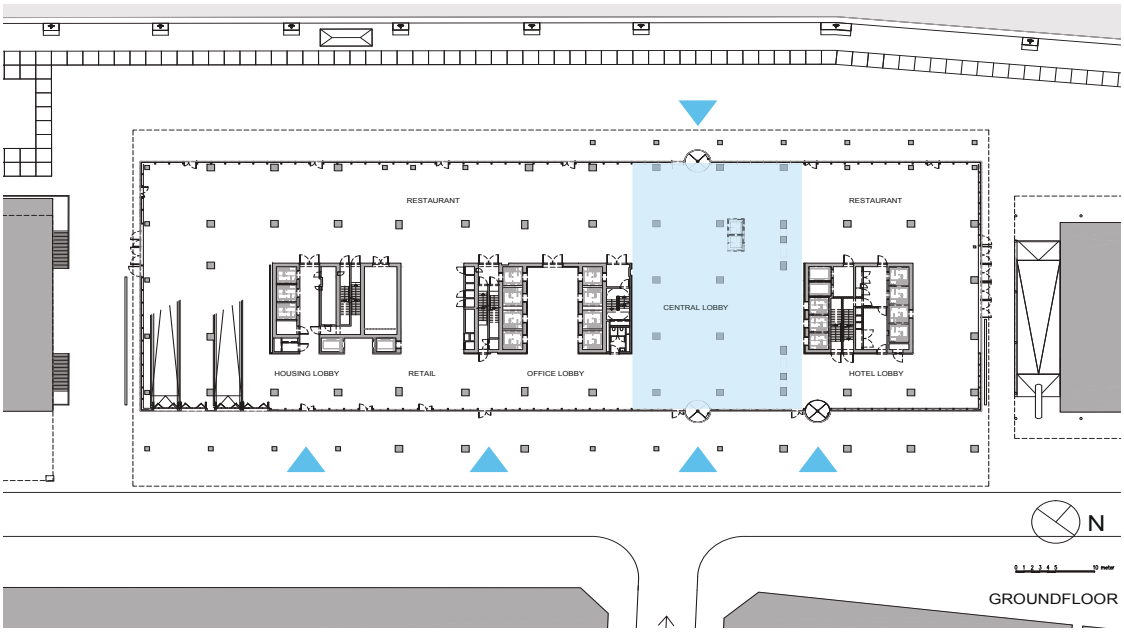


The relation with the public space of the city and the interior public spaces of De Rotterdam. Views from street, inside Rotterdam Square and escalator (with views to the parking area).
Images: © Ossip van Duivenbode

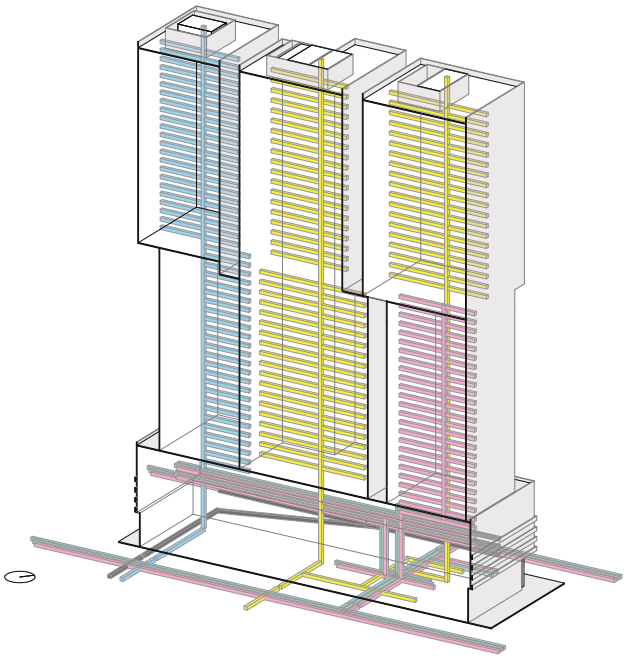


1 PARKING
2 LOBBY
3 LEISURE / COMMERCIAL
4 RESIDENCES
5 OFFICES
6 HOTEL
7 MEETING

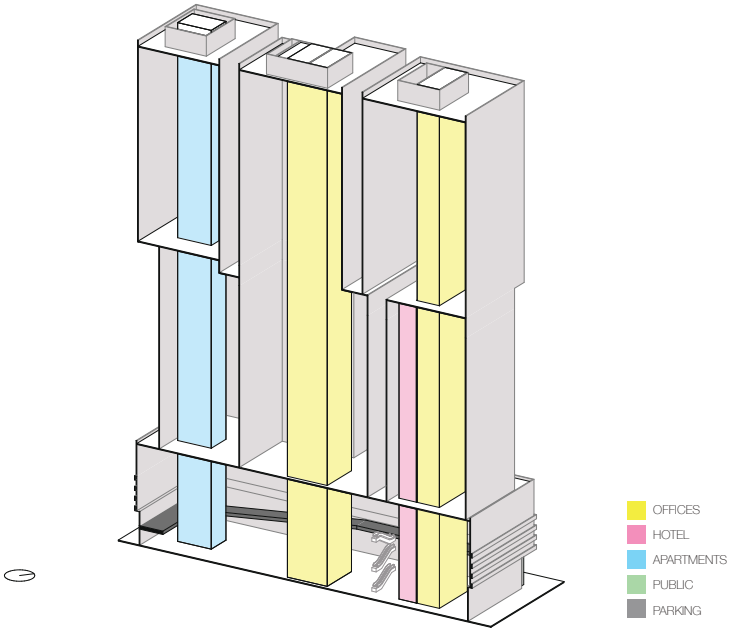
347



Drawings: Courtesy of OMA



USER FLUXES



VERTICAL CORES

Images: Diagrams made by the author

are differentiated and controlled at the ground level of the building. Although there are several doors giving short access to the different lobbies from the street, any program could be reached only after entering the building (even at the ground level where the restaurants are located, one is invited to enter the building, walk through the Rotterdam square, and only then enter the restaurants). This may seem a subtle feature, but if the lobbies and restaurants were accessed directly from the exterior, the character of the building as an 'enclosed form of urbanity' would change quite substantially, becoming feebler[47].

At the base, accessed from the Rotterdam Square, there are several restaurants, cafes and commercial activities. At this point, there's also a big escalator that allows access to a lobby for the offices at the first floor of the East tower. As one moves up on the escalator, there are interesting views over the parking area - not the usual dull and dark parking zone and on top of the escalator, an impressive void extends vertically (and externally) up to a height of 85 meters.

The top of the escalator gives access also to the levels 5 and 6 – wide spaces with higher ceilings that host a large leisure area. At a height of 25 metres, the 4-metre tall windows (from floor to ceiling)[48] this leisure area can be seen as the 'heart' of the vertical city – an attractive point of convergence for users and visitors, from which any other point of the building can be reached fast. These two floors *together offer approximately 8,000m² for retail, hotel, restaurants, cafés, wellness, offices and culture*[49]. At these areas, the confluence of vertical and horizontal fluxes might be able to generate interesting dynamics, as stated in the diagram that illustrates the fluxes of users. It is nonetheless regretful that such promising dynamics are limited only to the lower levels of the building, and that its potential isn't explored in higher levels to confirm the character of the whole building as an articulated system[50].

Another particularly interesting space within this building is the hotel bar/restaurant, at floor 7. Although its access is partially controlled (the access of public might be restricted in some exceptional occasions), it functions, most of the times, as a public space at a higher level, but it is also an exterior space strategically located in order to provide wind protection and spectacular views over the city, the river and the Erasmus bridge. This small spot has indeed become a hotspot for the city of Rotterdam since the opening of the building in November 2013 and it is also a place where public, tourists, office workers and inhabitants can meet at the end of a working day.

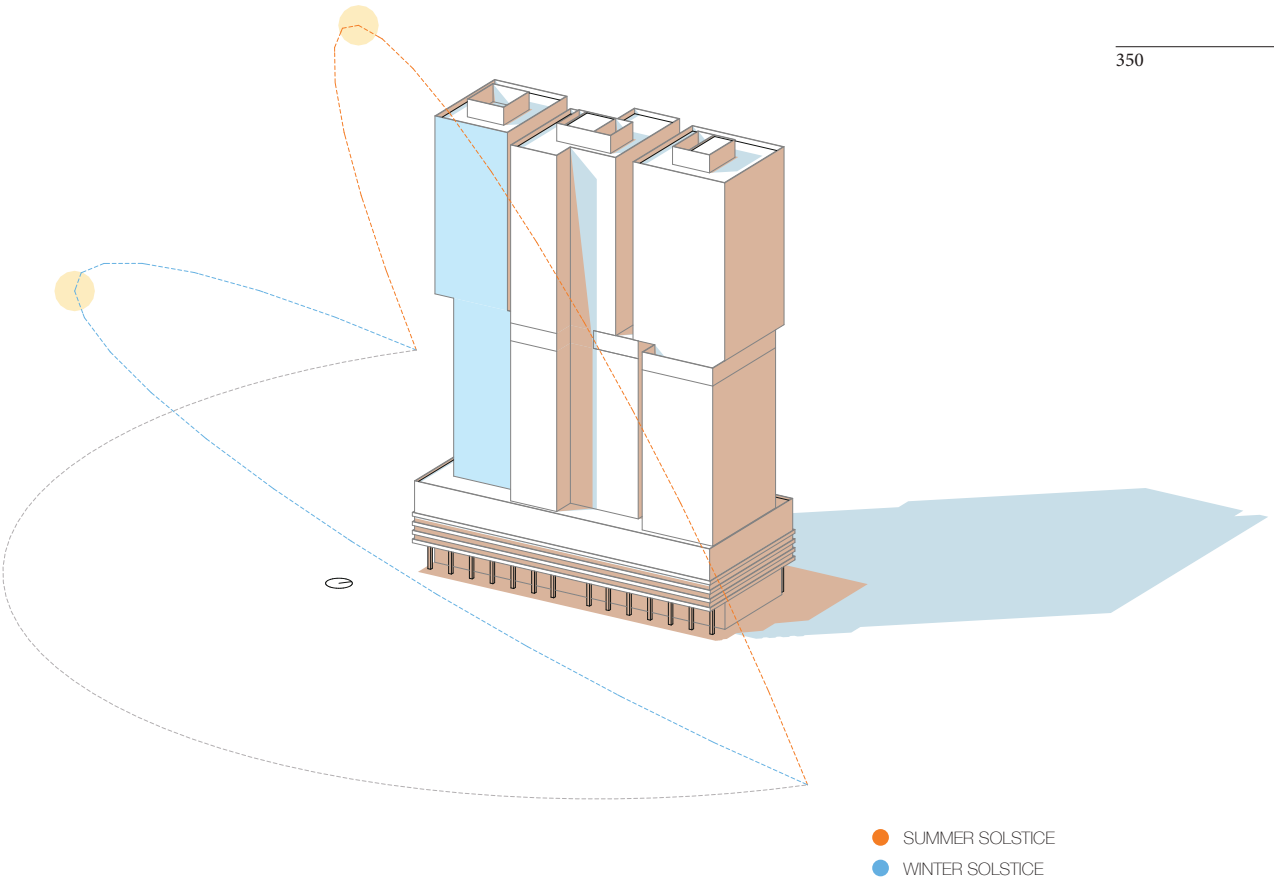
By stating the thrill involving this particular space (despite its modest dimensions), one could say that it should have been explored in other points of the building, functioning hypothetically as external spaces for office workers, or even at the housing tower, in order to provide the apartments with an exterior communal space (whose importance for the community life has been analysed in the chapter II). This would possibly make the apartments and the whole living concept of De Rotterdam more

47 We will clarify this observation through the analysis of our second case-study, the Entrepôt Macdonald.

48 Source: http://www.derotterdam.nl/en/leisure_area (01/08/2016).

49 Source: http://www.derotterdam.nl/en/leisure_area (01/08/2016).

50 This idea will be explored on our design experiments, on the next pages.



Images: Diagrams made by the author

inviting to families[51]. As per the words of the project manager Mischa Molsbergen, the current tenants are mainly trade workers, foreigners, young couples or affluent users who purchase more than one apartment to create large lofts. He adds that the Dutch families have quite a different conception of family apartments, which must necessarily contain large balconies, exterior leisure areas and greenery[52].

From the top levels of the plinth up, the uses are completely separated; however, within the towers, the sporadic visual contact between the office area, the hotel and the housing volumes may, help sustaining the *vertical city* concept as argued by Mischa Molsbergen[53]. Yet, the architecture itself does not seem to explore interactions between the different programs beyond this occasional visual contact; moreover, it does not stimulate the amount of social encounters that would be expected to occur at a so-called 'vertical city'[54].

Parking

At De Rotterdam, the car park is situated partly under the building (in two underground floors), and partly in height, within the built volume: three parking levels in the plinth facilitate a total 684 parking spaces with additional facilities for bicycles, scooters and electrical charging stations. These three upper levels of parking are naturally lit (with translucent glazing on the main façade) and are fully transparent towards the escalator and the public atrium below. This transparency could be seen as a statement: the one that the parking floors can be planned with aesthetic care, just as any other program in the building; and that the parking area could become a communal area as important as any other. Indeed, it is realistic to think that this will be the most frequently used intermediary zone - in between the urban space and the home door / work station - where residents, visitors and employees can easily come and go as they please while remaining comfortable in all weathers. The parking at the Rotterdam is ample, well lit and bears a feeling of comfort that once again relates closely to the American Examples, as the elevated parking floors at the Marina City or at the John Hancock centre.

1.5. Housing at De Rotterdam – living in a 'Vertical City'?

De Rotterdam contains 240 apartments and a few penthouses, both owner-occupied and rented, all of them concentrated at the West Tower, which is said to be "*the one with best sun exposure, wind protection and unrestricted views*"[55]. They range in size between 65 m^2 and 250 m^2, and all of them benefit from fully glazed façades and impressive views over the river and city.

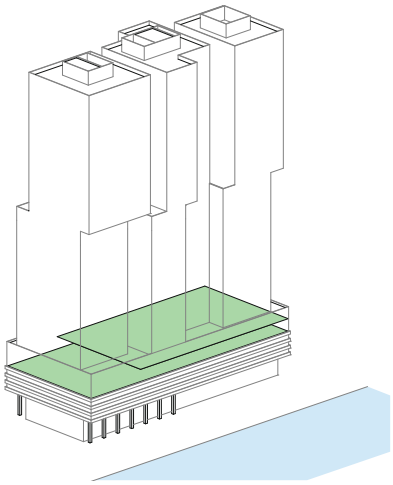
51 This idea will be explored on our design experiments, on the next pages.

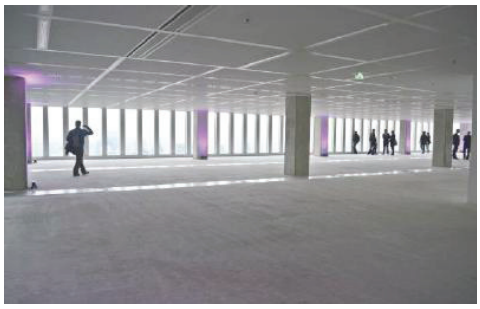
52 Personal interview with Mischa Molsbergen, held in May 2014 in Rotterdam.

53 *Ibidem.*

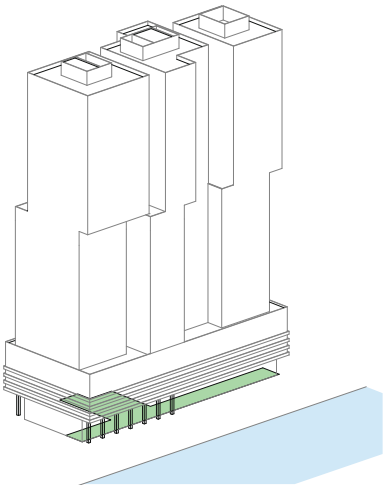
54 This idea will be explored on our design experiments, on the next pages.

55 Lecture by Kees van Casteren, "The architectural concept of De Rotterdam", held at the Complex Design Seminar *De Rotterdam: Exploring the Vertical City*, on the 4th of July 2014 in Rotterdam.

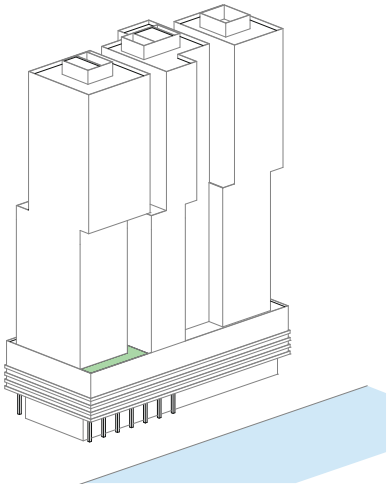




Common Floors - Levels 5 & 6
(Fitness centre/ Art Gallery/ Restaurants)
Images: © Ossip van Duivenbode



Level 0 - Public Plaza
Rotterdam Public Square
Images: © Ossip van Duivenbode



Level 7 - Esplanade
Hotel Bar / Restaurant
Images: © Ossip van Duivenbode

Images: Diagrams made by the author

The design of the apartments at De Rotterdam might be seen as one of the feeble points of the building, since these do not respond, typologically, to any objective social needs nor to a sustained market study or research. They seem to have been designed to efficiently occupy a predefined architectural envelope and to be directed to a restricted and decontextualized population, expected to endure the high rental and selling prices proposed by AMVEST[56]. The dwellings, just like the offices, retail and leisure areas, are spatially generic and follow what seems to be part of a global trend.

The apartments, most likely among the most expensive in Rotterdam, have spectacular views, of course, but their typologies are surprisingly banal, offering spaces that are mostly dull and not so different from the offices located at the neighbouring tower. Although its built density of 42 is indisputably impressive[57], De Rotterdam does not seem to experiment with creativity within the rigidity and compactness of its envelope.

On the other hand, the stimulation of social and functional relations that the concept of 'vertical city' could a priori suggest does not seem to have been object of much exploration either: it occurs only up to the 6th floor at the plinth of the tower, where the total surface of the plot is conceived as an open plan. As we have seen, the first levels of the podium (that can be accessed directly from the housing lifts) host restaurants, lobbies, car access, parking floors and two floors of commercial, cultural and leisure services that can be used by the inhabitants.

Through an analysis of user flows [see diagram], and despite some punctual vis-à-vis situations between the dwellings and the office spaces [see diagram in the next page], one understands that "*the idea that you get out of bed just six floors of a person who works in an office can dissipate fairly quickly*."[58]

Moreover, the central elevator core that serves the ensemble of the dwellings vertically leaves small chances for interaction between neighbours, for the vertical circulation triggers the "*absence of articulation*" that has early been highlighted by Rem Koolhaas in regards to the American hybrids: "*The elevator is the ultimate self-fulfilling prophecy: the further it goes up, the more undesirable circumstances it leaves behind. It also establishes a direct relationship between repetition and architectural quality: the greater the number of floors stacked around the shaft, the more spontaneously they congeal into a single form. The elevator generates the first aesthetic based on the absence of articulation. (…) Throughout the multiple reinforcement of these two breakthroughs, any given site can now be multiplied ad infinitum to produce the proliferation of floor space called Skyscraper*." [59]

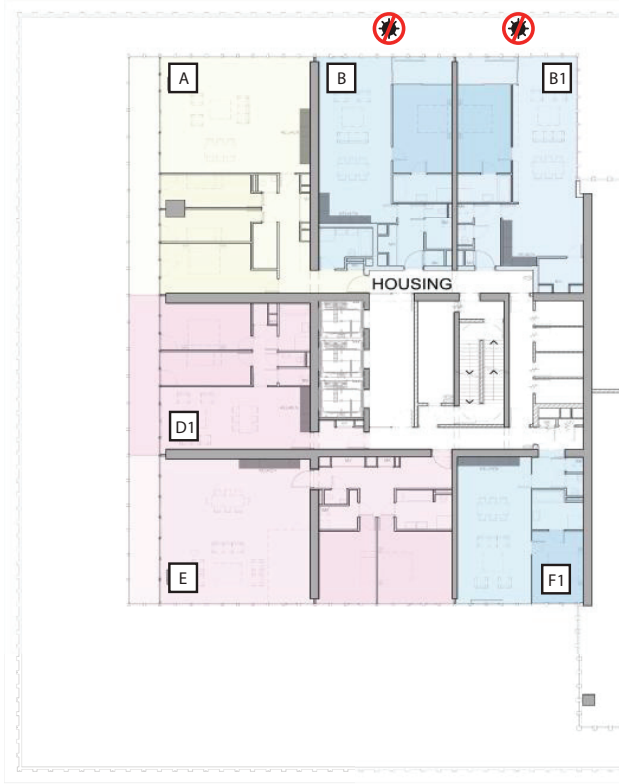
At the same time, one should note that the apartment tower at De Rotterdam is not very different from any other generic and free-standing apartment tower, since the inhabitants have direct access to the lobby from the street at the ground level (with no

56 The full range of dwelling typologies and corresponding rental and selling prices (ranging from 180'000€ to 750'000€) can be consulted at www.44floors.com.

57 Built density is calculated through a ratio between the total built area of the building (162'000m^2) and the area of the plot (3'852m^2).

58 Oliver Wainwright, « Rem Koolhaas's De Rotterdam: Cut and Paste Architecture », *op.cit.*

59 Rem Koolhaas, *Delirious New York*, op. cit. p. 82.



Images: Diagrams made by the author

need to cross the public square or any other shared space of the so called 'vertical city'). The inhabitants have also the possibility to enter the apartment floors by taking the lift directly from the parking zone. All things considered, the aspects that could make the experience of living at De Rotterdam interesting are:

a) the sporadic visual contact between the apartments and the office towers;

b) the possibility of going to the restaurant/fitness/commercial areas inside De Rotterdam, and encountering other users or public, without leaving the building;

c) the fully glazed façades, the large balconies, the outstanding views and the particular architectural features of the building;

d) users that live and work inside the building may benefit from the comfort of living within a building that responds to many of their daily needs;

e) the inhabitants have direct access to the leisure area located on the floors 5 and 6 by using the housing lift (external users also have access to this floor via escalators); yet, to go to the hotel bar at level 7, for instance, they are forced to go down to the ground floor and take the hotel lifts up).

Living at De Rotterdam

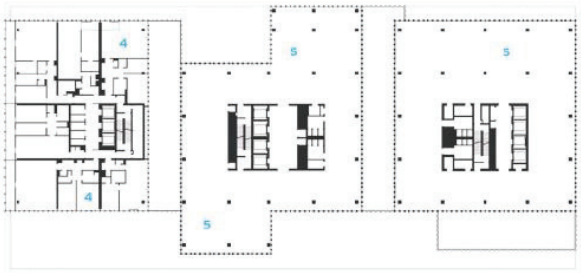
At De Rotterdam, the apartments are all contained within the West tower and arranged around a central core (with 3 elevators). The apartment layout follows two typical plans corresponding to the bottom and the top of the tower (except for the level 43 that contains three penthouses) and there are only slight typological variations between the apartments on the two typical floor plans.

As mentioned above, the apartment layouts are speculative and simplistic and they do not seem to have been conceived for a particular user type[60]. The information that we have obtained from the developer is that very few families with children have showed interest in moving to De Rotterdam. The apartments suit mainly foreigners, business people, couples without children, gay couples and people who don't use the apartments as permanent residences, but only a few days per year. From the observation of their internal layout and restricted areas, the apartments don't seem to correspond to a luxury category either. Below, we will try to explain why these apartments are rather deceiving than innovative.

orientation

The apartments follow a radial distribution around the core and, except for the corner apartments, they have only one orientation. The first issue that is noticeable

60 Mischa Molsbergen has indeed commented that it would have been smarter, considering the target-public, to do have planed more penthouses and less small apartments (the penthouses have been the first to be sold). Lecture by Mischa Molsbergen, "De Rotterdam: The process of conception, construction and management", held at the Complex Design Seminar *De Rotterdam: Exploring the Vertical City*, on the 4th of July 2014, in Rotterdam.



1 PARKING
2 LOBBY
3 PUBLIC
4 RESIDENCES
5 OFFICES
6 HOTEL
7 MEETING

TYPICAL HIGH-RISE FLOOR

1 PARKING
2 LOBBY
3 PUBLIC
4 RESIDENCES
5 OFFICES
6 HOTEL
7 MEETING

TYPICAL LOW-RISE FLOOR

1 PARKING
2 LOBBY
3 PUBLIC
4 RESIDENCES
5 OFFICES
6 HOTEL
7 MEETING

FIRST FLOOR

Plans: Courtesy of Kees van Casteren/OMA

is that the apartment typologies B, B1 and C are oriented North and are rather deep (11 to 15m), which allows us to understand that, despite the privileged views, they endure poor conditions in terms of lighting. The rooms at the apartment C are fully directed towards the office tower that is placed only 6 m apart, which might not only generate complete shadow on these areas, but also be at the origin of privacy issues inside the apartments, between two very different types of users.

access lobbies

Regardless of how impressive the housing lobby may look at the ground level, with its double height and its exuberant brass finishes (cladding both the elevator lobby and the sculptural volumes of the mailboxes at the entrance), the arrival at the apartment floor is rather deceiving and opposed to this first promising glance of charm. After taking the lift to a housing floor, one arrives at a hall with minimum dimensions (2,5m by 8,6m) and no natural light of any kind. This arrival hall allows access to other thin corridors on the sides (1,5m by 9,6m), where the entry doors to the apartments are found (3 on each side). Indeed, the inhabitant walks through two dull spaces when he reaches his floor by elevator, and before being at his own private space: the elevator hall and the access corridor, to reach then another small hall inside the apartment.

the apartments

A trait that applies to most of the dwelling units is that the entrance hall is a small compartment with no natural light. Some variations most be detailed:

- In the worse cases – the apartments A, C and E, this small hall (roughly 1,5m by 2,6m) is directly linked to the distribution corridor of the bedrooms, which means that one enters the apartment from its most private zone;

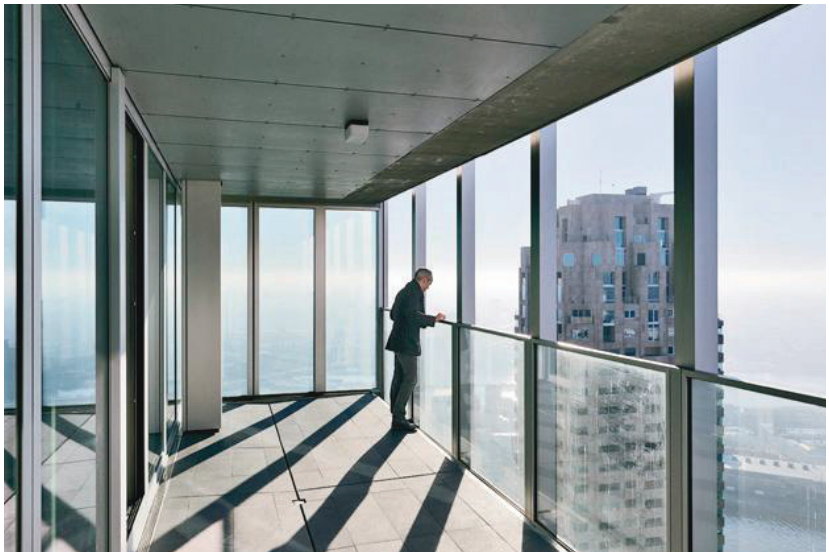
- In the typologies B and F there's a very small hall (with a service toilet in units B and F) doing the transition between the entry door and the living area of the apartment.

- In the typology D, the small hall is linked to the living area of the apartment.

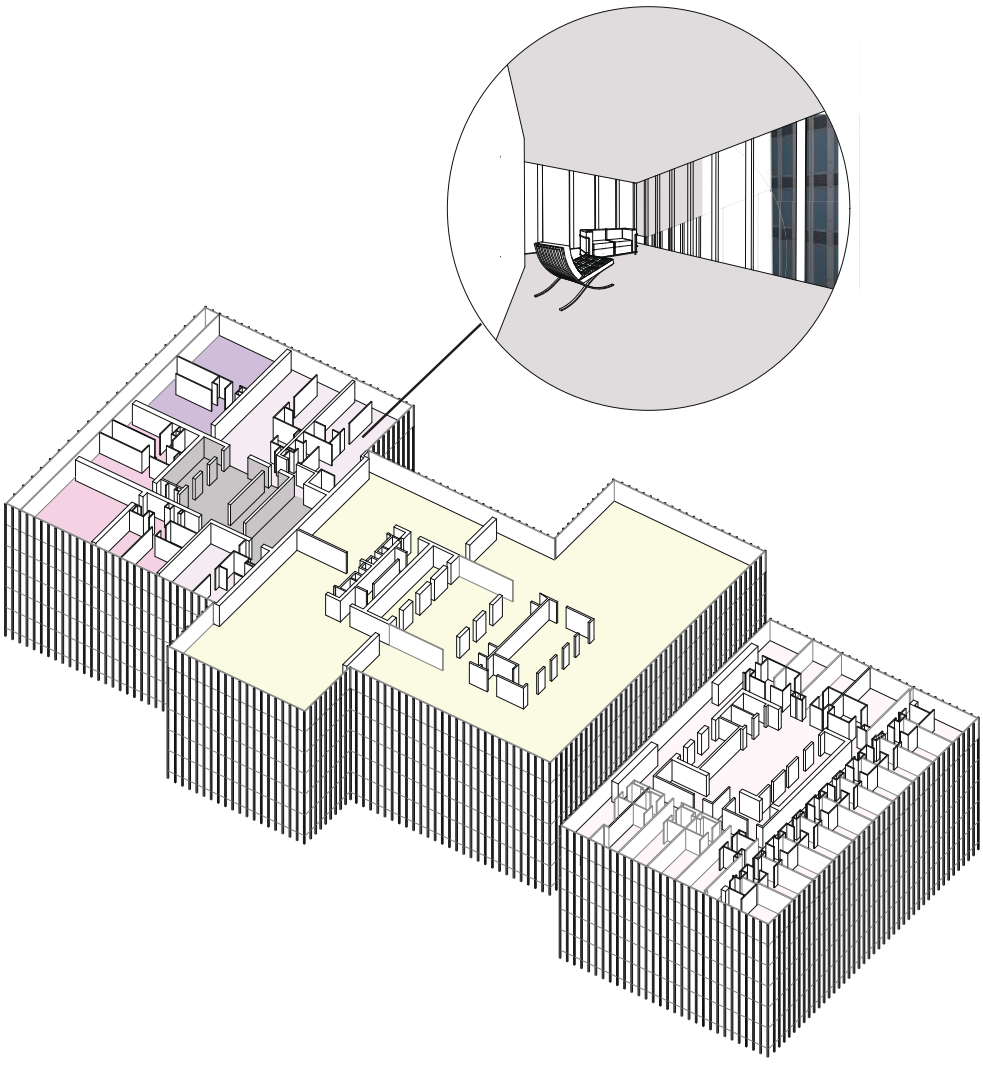
It seems indeed that the idea of transition between different privacy levels (intimate and shared zones) has not been thought through, and this idea gets even clearer as we understand that, in units B, F and F1, one needs to cross the living room in order to reach the bedroom.

bedrooms

The proportions of the different rooms inside the apartments are also unbalanced, somehow giving the feeling that the each apartment layout has been stretched in order to match the outline of the building. This results on strange proportions mainly when it comes to the bedrooms. In units A, D and D1, the smaller bedrooms



De Rotterdam Balcony
Image: courtesy MAB Development



Images: Diagrams made by the author

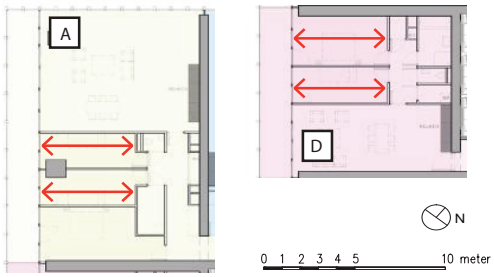
are very long and very narrow (roughly 2,2m by 5,8m). Although their area would be acceptable with different proportions, with such configuration they look so small and narrow that its suggested use would be a small office space rather than a bedroom. It is equally curious to notice that, despite the high standard character of the apartment units, in the apartments A, C, D, D1 and E there are only shared toilets, and none of the rooms has its own private bathroom.

living areas

In units B, D and D1, the issue of depth described above applies equally to the living areas, with 4,24m by 11m, with the kitchen located at the opposite wall towards to glazed façade, in a very shallow zone. All the kitchens are open-plan kitchens – even for the largest apartments, and seem to be randomly located in the points that have the least natural light, without revealing any kind of strategic or functional design.

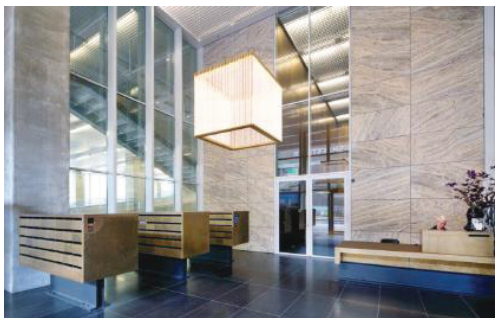
Regardless of the speculative and repetitive character of the apartments, we believe that a more exhaustive work should have been done on the planning of the typical apartment layouts in order to make them spatially more interesting. The only feature that may lend a luxurious character to these apartments is, aside with the views through the fully glazed façade, the continuous balcony [image] running through the different rooms (except for the apartment F)[61].

In order to allow the apartments at the Rotterdam to suit the high range category and the market target they seem to be directed to, it would undoubtedly have been preferably to plan fewer apartments per floor with more generous areas and with layouts that could be spatially more comfortable and allow for a wealthier experience of living. Ideally, some typological variation between the different floors could be explored in order to suit the needs of a wider range of users. Moreover, the experience of living at De Rotterdam could be improved through the planning of intermediary spaces, some to be shared by the many different users, and others to the sole benefit of the inhabitants. We will try to develop these principles our design experiments in the next chapter.



61 Nonetheless, the comfort of these balconies, at such height and with such big glazed protections, might also be questionable.

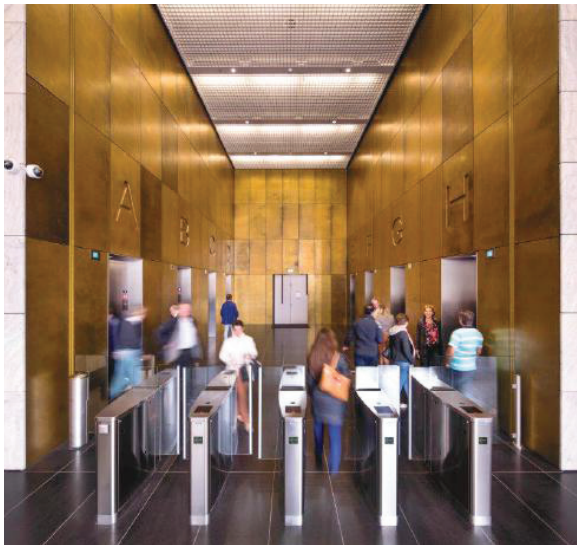
LIVING



Parking, apartments lobby and apartment living area

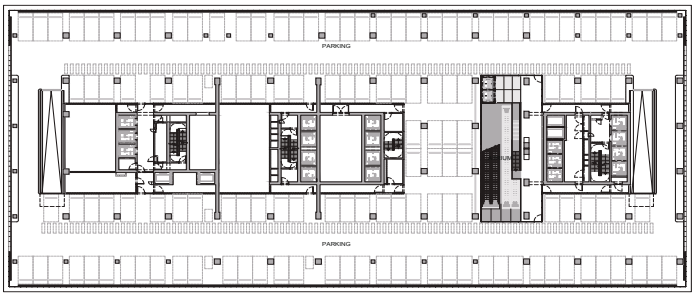
Image Credits: Edward Hill

OFFICES



Office lobby and office spaces

Image Credits: Edward Hill



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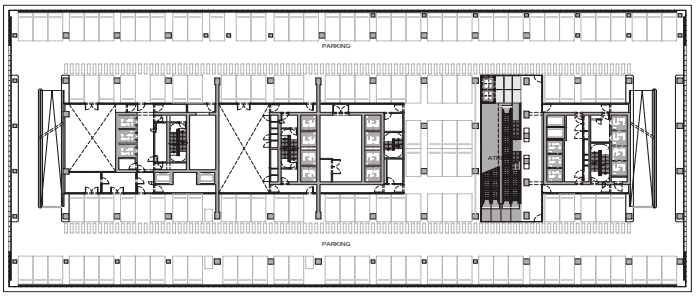
FOURTH FLOOR



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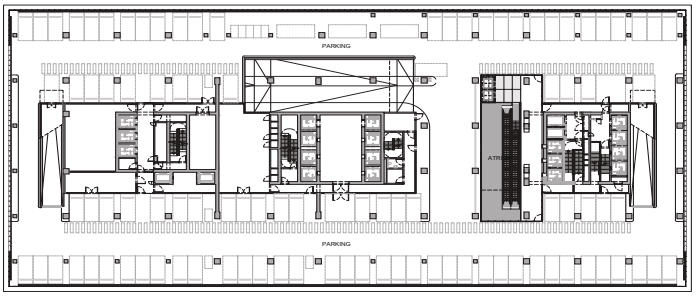
THIRD FLOOR



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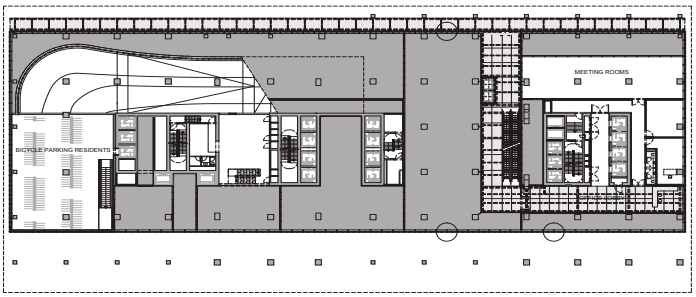
SECOND FLOOR



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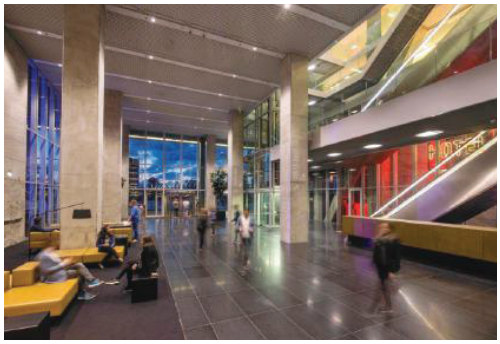
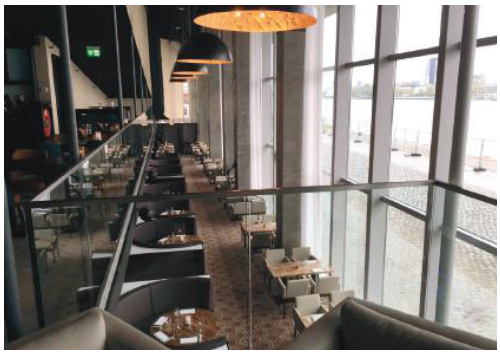
FIRST FLOOR

LEISURE

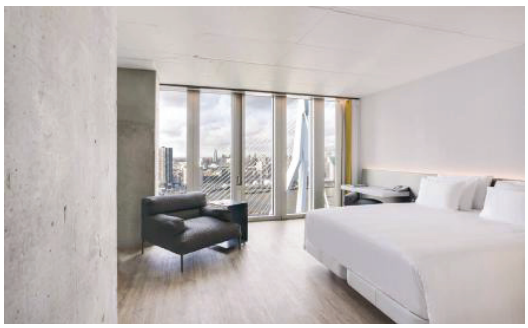




Restaurants (Ground level)

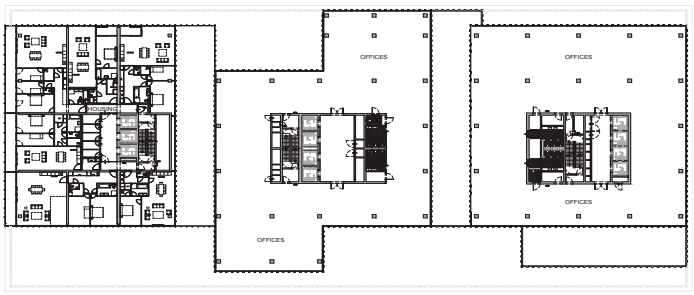
Image Credits: Edward Hill

HOTEL

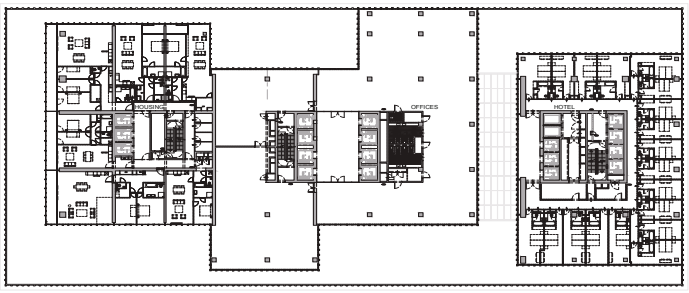


Hotel lobby, lifts and café/restaurant

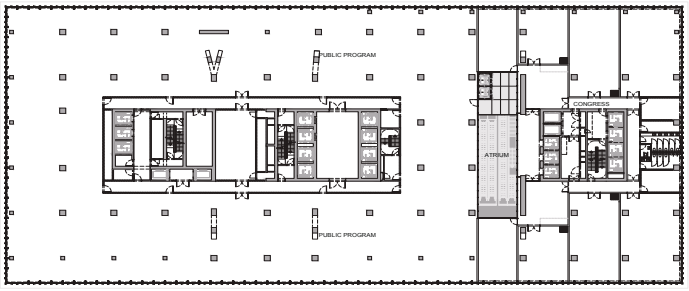
Image Credits: Edward Hill



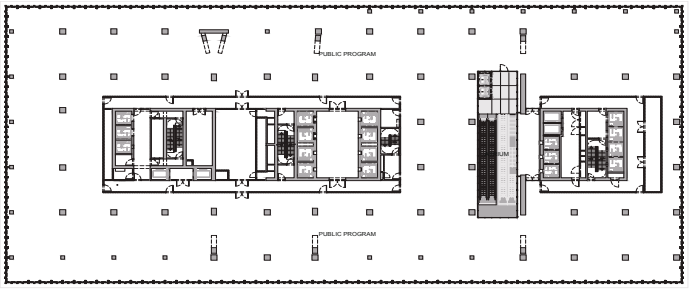
TYPICAL HIGH-RISE



TYPICAL LOW-RISE



SIXTH FLOOR



FIFTH FLOOR

Plans: Courtesy of Kees van Casteren/OMA

Case-Study 2

Entrepôt Macdonald

The Horizontal "City within the City"

Original building structure
Source: Fonds Patrick Forest, Gérard Guillat

Entrepôt Macdonald - the original building
Source: Fonds Patrick Forest

2.

Entrepôt Macdonald
OMA, Floris Alkemade + Xaveer De Geyter
Paris, 2007-2015

2.1. Site, context and historical background

More than elsewhere in Paris, the Northeastern area of the city has a history of infrastructures and manufacturing that lends the long-term industrial character to the area in which the Entrepôt Macdonald is inserted.

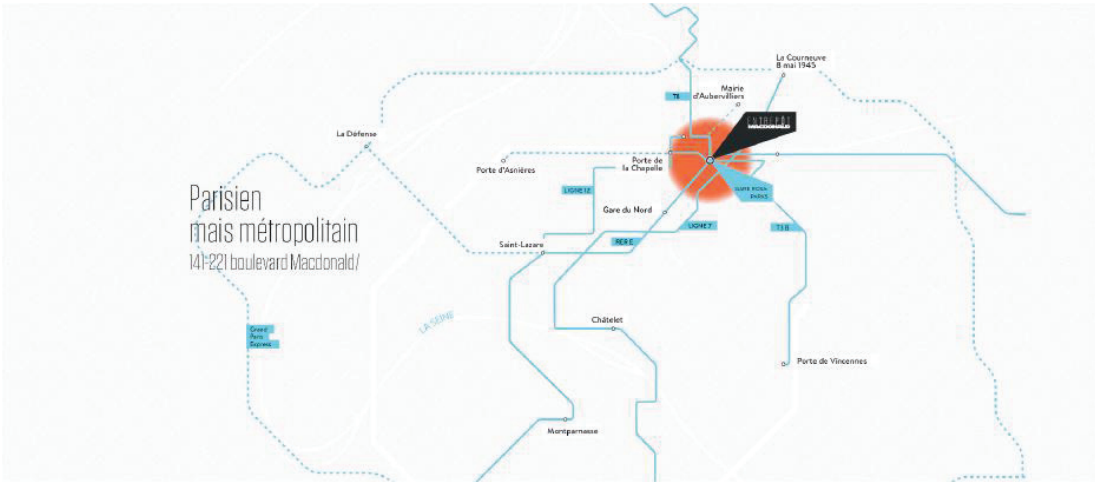
The landscape of this zone, between the old abandoned "fortifications" and the red suburbs, was formed throughout the nineteenth century by a tangle of railways, canals and remote muddy paths. Continuing urbanization underway, a gas plant has been installed, in 1858, on the ground of the future Entrepôt Macdonald – a site with 17,5 ha, between the railways of *Gare de l'Est* and *Canal Saint-Denis*. From the distillation of coal that produced an illuminating gas, Paris was the city of light, highly contrasting with its suburbs, constantly exposed to noxious odors, the sooty smoke and imminent risks of explosion[1]. The factory was on activity between 1858 and 1955, leaving the soils polluted for decades.

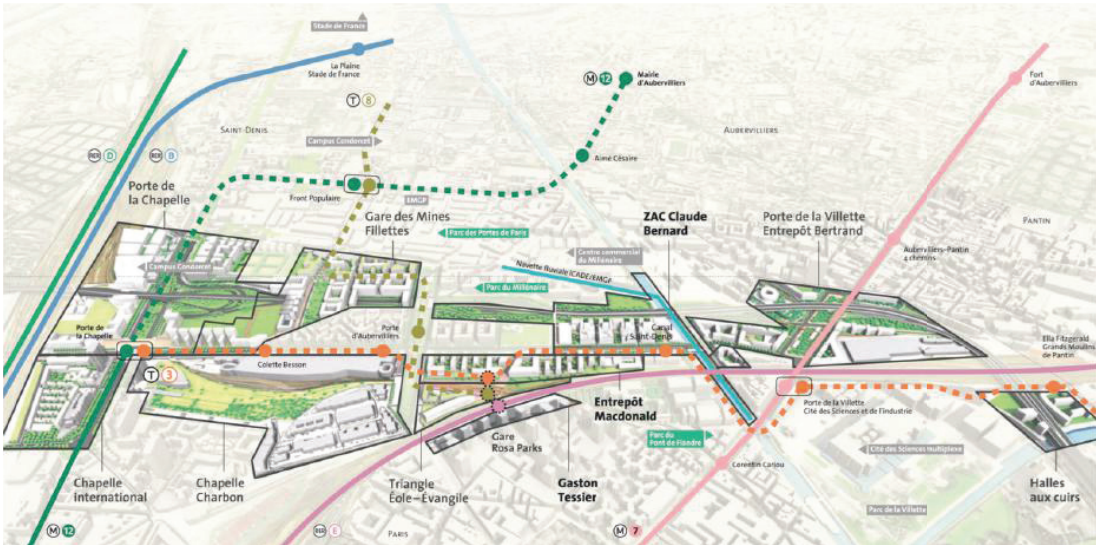
In 1964, when car traffic became more intense and forced the city to regulate its commercial circulation, the creation of a transit rail center has been determined for the boulevard Macdonald, and implemented on top of the old gas factory. The architectural conception of this warehouse has been attributed to the architect Marcel Forest (1910- 1998), together with his son Patrick. At the time of its conception in 1966, the city of Paris requested the conception of a structure bearing the potential to evolve with time, capable to adapt do different uses and conditions in the future. In response, Marcel Forest imagined a base building in concrete (with a robust 8,50m x 8,50m column grid), able to support the future addition of three extra floors, and thus carrying, from its start, the possibility of a future transformation[2]. Built by the company SNTR Calberson, its completion was attained in 1970[3].

1 Source : http://www.entrepotmacdonald.com (15/07/2016).

2 The second life of the Entrepôt Macdonald warehouse had been envisioned since its early conception, as stated by the architect Marcel Forest in 1969: "*Du fait de la servitude imposée par la Ville de Paris d'une future construction pouvant comporter trois autres niveaux et non encore décennie, et pour que celle-ci puisse conserver son indépendance architecturale, la construction actuelle, étant donnée sa grande longueur, devait être étudiée pour apparaître en quelque sorte comme le socle, le soubassement des constructions futures. On n'engage ainsi en rien leur définition: construction unique ou constructions multiples, de destinations très différentes pouvant aller du simple entrepôt aux constructions scolaires ou aux salles de sport.*" *in* SA Paris Nord-Est, *Entrepôt Macdonald – Dossier de presse*, SA Paris Nord-Est, Paris, 2009, p. 15.

3 SA Paris Nord-Est, *Entrepôt Macdonald – Dossier de presse*, SA Paris Nord-Est, Paris, 2009, p. 15: "*L'entrepôt Macdonald, construit par la société de fret SNTR Calberson, a été achevé en 1970. Situé boulevard Macdonald, Paris 19e, à deux pas de la Porte de la Chapelle, il est directement desservi par la ligne des chemins de fer de l'Est et de la Petite Ceinture*".





Map illustrating the GPRU (Grand Projet de Renouvellement Urbain) of Paris Nord Est
Source: Agence Leclercq-Semavip

When the Entrepôt Macdonald was completed, besides being considered a remarkable infrastructural building, it became the longest building in Paris: "*Son propre réseau de rampes, voies et quais en fait un bâtiment-insfrastructure dédié à l'intermodalité rail-route. Sis sur un terrain de 5,5 ha, d'une longueur exceptionnelle de 617m, soit quasiment les dimensions de l'île Saint-Louis, le bâtiment offre 131'000m² utiles sur trois niveaux*"[4]. Its surface of storage exceeded 90'000 m² and was distributed along two different levels, connected by a ramp at the West edge of the building, allowing the loading of trucks. The building became a "*logistics warehouse shifting goods from trains to trucks in an industrial no-mans-land*"[5]. Over time, the flexibility of the building's internal structure has been tested with the creation of offices, restaurants or other specific programs (for instance the reserves of the Louvre).

2.2. The Entrepôt Macdonald – The general Process

In 1980, the construction of the *Parc de la Villette* triggered a vast process of transformations that eventually affected the whole northeast sector of Paris. At the time, the area confined between the railroad tracks and the *Boulevard Périphérique* was reprogrammed, implicitly announcing the potential of the future Entrepôt Macdonald as a strategic piece of the operation. Later, in 2001, Paris started to focus on the transformation of its boundaries and the reintegration of the sectors *Portes de Paris* in the city has officially begun. At that time, 11 sites were identified on the fringes of the capital, based on their potential of development. The GPRU[6] [image] was then launched in 2002 and thus a reflection on the second life of the Entrepôt Macdonald has finally become a subject; located in the heart of the periphery, the Entrepôt Macdonald is indeed an important point of GPRU Paris Nord EST. Within the 200 hectares that go from *Porte de la Chapelle* to the *Porte de la Villette*, the transformation of the area has followed three key priorities, as per the *Rapport de Stratégie Urbaine*[7]: a) improving the quality of life of the city area; b) enabling the establishment of new economic centers; c) creating a program of vibrant balances, engaged in housing - especially social housing - and diversity of economic activities. Adding to these principles, the integration of infrastructures was also a priority, envisioning an association of a *gare RER* (Rosa-Parks) and a tramway line crossing the site of the Entrepôt Macdonald.

4 *Ibidem.*

5 Mariabruna Fabrizi, Fosco Lucarelli, "Mega Mac", *Uncube Magazine*, January 2016; Web source: http://www.uncubemagazine.com/blog/16518845 (12/07/2016).

6 GPRU stands for *Grand Projet de Renouvellement Urbain* and designates an urban renewal operation conducted in Paris.

7 Read more in Dusapin&Leclercq, *Projet Paris Nord Est – Rapport de Stratégie Urbaine*, Ville de Paris – Direction de l'Urbanisme, Paris, January 2008, pp. 47-51. Source:https://paris-nord-est.imaginons.paris/sites/default/files/cr_rp_pnee_020215_vf-ok.pdf (15/07/2016).

View from the nearby warehouse. Roof used as car pound, 2009.
Source: SA Paris Nord-Est, Entrepôt Macdonald – Dossier de presse, SA Paris Nord-Est, Paris, 2009, p. 14

In 2006, the warehouse was put up for sale by SOVAFIM[8]. Seeing the occasion as a thrilling opportunity, a group of urban stakeholders (mainly public) – SEMAVIP[9], Caisse de Dépots and ICADE[10] - have immediately gathered as a Group – the SAS ParisNordEST – in order to endure the high commercial cost of the site. The strategic situation of the Entrepôt Macdonald - located at an intersection point of the North and East railway lines close to *Gare de La Chapelle*, and benefiting also from a privileged traffic setup, close to the *Boulevard Périférique* that distributes to all highways and airports[11] - made it an ideal candidate for a densification project and an undoubtedly ravishing opportunity to build 'city within the city', while "*literally using the existing building as a base on which a new city with a different scale would be erected*"[12].

Building new or rebuilding?

With the land acquired by the SAS ParisNordEST, the first decision that had to be made was between renovating the existing warehouse and building something completely new. Nonetheless, the advantages of deciding for a reconstruction stood out immediately:

1. the patrimonial value of the existing building and the importance of preserving the heritage of the XX century industrial architecture[13];
2. conserving the XXL scale of the area - as enhanced by François Leclercq, the urban planner of the project *Paris-Nord-Est:* "*En affirmant la présence de cet entrepôt singulier, c'est aussi la grande échelle caractéristique de ce secteur du nord-est parisien qu'il s'agit de conserver*"[14];
3. a reconversion allowed for building a much larger area than building new: "*D'après le plan local d'urbanisme, sa destruction permet uniquement la reconstruction de sa surface identique, alors que sa*

8 SOVAFIM stands for *Société de valorisation foncière et immobilière*. http://www.sovafim.fr.

9 SEMAVIP stands for *Société Economie Mixte Aménagement de la Ville de Paris*. http://www.semavip.fr.

10 ICADE is a French real estate group, a subsidiary of *Caisse des dépôts et consignations*, created in 1954

11 *"En effet, il se situe au point d'intersection des réseaux Nord et Est reliés par la ligne de la petite ceinture, à proximité de la Gare internationale de La Chapelle, ouverte à tous les réseaux européens et notamment à ceux du Marché Commun. La desserte routière est aussi favorable. L'entrepôt Macdonald est très proche du boulevard périphérique qui donnera accès à toutes les autoroutes, à tous les aéroports parisiens. De plus, aux portes mêmes de l'entrepôt passera bientôt le grand axe routier nord-sud, dont une bretelle desservira le bâtiment »*, F. Roberty, « Entrepôt Macdonald – visite de chantier du 22 Mai 1969 n° 52 – Introduction », Annales de l'Institut Technique du Bâtiment et des Travaux Publics, 1969, p. 2. *in* Mathieu Mercuriali, *Concevoir à grande échelle – Modèles d'interfaces de mobilité et stratégies de transformations urbaines*, EPFL Thèse de doctorat, 10 Septembre 2015, p. 291.

12 Floris Alkemade et FAA+XDGA, "Cadavre exquis", », *in* Mathieu Mercuriali, *141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald,* Pavillion de l'Arsenal, Paris, 2014, p. 210 (pp. 204-225).

13 SA Paris Nord-Est, *Entrepôt Macdonald – Dossier de presse*, *op. cit.,* p. 15.

14 *Ibidem.*

Overall view of the construction site from the West side, June 2013.
Source: Photo Weiner; published in Marta Brandao, « Variations sur le thème de la complexité à grande échèlle », Tracés, April 2014 p. 13.

conservation permet de doubler le volume bâti. Par consequent, le PLU (Plan Local Urbanisme) doit être modifié pour permettre le changement d'affectation de la zone industrielle en zone habitable"[15];

4. demolishing the existing building and preparing the soil for the construction of a new project would be extremely costly, for it would imply the depollution of a 150 year industrial site;
5. reconstructing would mean keeping the original size of one of the largest buildings in Paris and, thus, enhancing the role of the building as a landmark and potential catalyst for the regeneration of the whole Paris Nord Est area: *"L'âge du fret, de la desserte routière et ferroviaire, le temps de la présence d'activités semi-industrielles s'est accompagné d'un gigantisme dont l'entrepôt Macdonald est un reliquat magnifique... Plutôt que d'imposer, pour les constructions à venir, les standards d'une ville contemporaine connotée et menacée à court ou long terme de désuétude, nous avons souhaité que les principes architecturaux naissent d'une infusion des particularités du site.[16]"*

2.3. The Entrepôt Macdonald – The Design Process

The early start of the project

In the fall of 2007, with the building on the hands of the SAS ParisNordEST, all conditions were finally reunited for the project to start. In that sense, an international competition was launched for the reconversion of the warehouse, with a base program defined by the city of Paris. The initial parameters implied extending the area of the existing warehouse to 165'000 m^2 on the one hand and, on the other hand, remaining within the maximum height defined by the PLU (31m). Forty days later, this competition has resulted on the appointment of the team OMA / Floris Alkemade, which has been assigned to develop the general conceptual project of the new Entrepôt Macdonald, leaving behind the proposals of Diener & Diener, Alexandre Chemetoff & associés and Marc Mimram. The winning entry proposed the resolution of the densification and program mix challenge through a distribution of activities in three layers: retail at ground level, offices and activities at the first floor and housing at the upper levels distributed along 11 cylinders and rings that intended to match the scale of the Parisian *îlots*. From this base design, several variants have been explored: first the transformation of the cylinders into rectangular blocks, and then a more radical solution which has been called 'Double-Mac': simply doubling the existing volume with a block containing housing, subtracted in the middle to allow the creation of an inner courtyard.

15 Mathieu Mercuriali, *Concevoir à grande échelle – Modèles d'interfaces de mobilité et stratégies de transformations urbaines*, EPFL Thèse de doctorat, 10 Septembre 2015, p. 291.

16 François Leclercq, *in* SA Paris Nord-Est, *Entrepôt Macdonald – Dossier de presse*, SA Paris Nord-Est, Paris, 2009, p. 15.

PATIO BLOCK

SILOS

BLOCKS

VARIED BLOCKS

URBAN FABRIC OF THE ILE SAINT-LOUIS

IGH TOWERS

CROSS

DOUBLE MAC

Volumetric Sketches, OMA, 2008.
Source: ***141-221 boulevard Macdonald 75019 Paris,*** Pavillion de l'Arsenal, Paris, 2014, p. 210.

Concept design phase: one Big Building or a juxtaposition of small buildings?

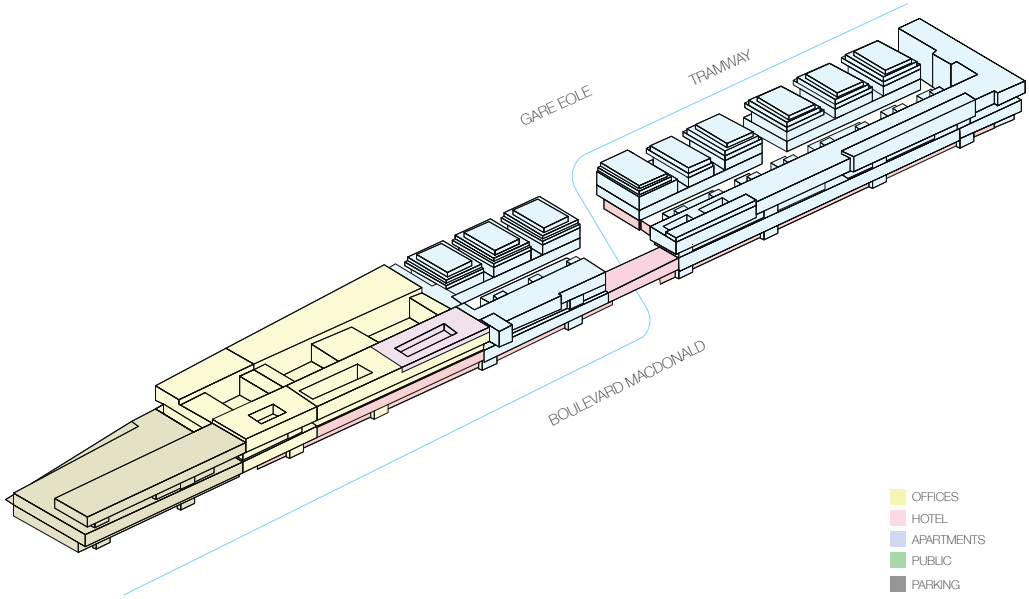
In the beginning of 2008, a series of workshops have been held, envisioning the delineation of the project. Departing from the base OMA principle - the 'Double Mac' -, some important changes in the program mix and in the housing principles have been made, matching the will of the developers and investors. Instead of the superposed layers of commerce, offices and housing (in a logic that would bear some similitudes with the strategy of 'Vertical Urbanism'– *Urbanisme sur dalle*), the building has been fragmented into multiple parts that were then assigned to the different program categories; the housing part has also been subdivided into multiple small blocks, each containing a particular housing type.

In general lines, the program has been subdivided into three sectors: at east, public equipments; in the middle, offices; at west, housing. The strongest reason motivating this type of segmentation is a rational distribution of the different investors, making the ownership simpler and reducing intricacies of shared spaces in volume, which had caused issues, in the past, in other Parisian buildings. Nicolas Michelin, urban planner and architect of 2 housing blocks at the Entrepôt Macdonald, explains: "*En France, dans les années 1970, on a construit des monstres tels que la dalle de Beaugrenelle ou celle de Montparnasse, c'est-à-dire des grands lots avec des galeries commerçantes et au-dessus des bâtiments sociaux et des petits équipements. Ce sont des projets très intéressants sur le papier mais qui ont été mal gérés dans la découpe et qui ont surtout mal vieilli. Les copropriétés sont tellement enchevêtrées que lorsqu'il y a le moindre problème (une fuite d'eau), on ne sait pas qui doit financer la réparation. Par exemple, un propriétaire ne pourra pas revendre son logement s'il y a des parkings communs avec les bureaux ou si les parties communes ne sont pas bien entretenues. Cela génère des formes de copropriétés complexes qui font peur aux investisseurs. Depuis les années 1990-2000, on fait donc un immeuble de bureaux, un immeuble de logements. La division des programmes est très claire. Personnellement, je défends la mixité et j'essaye de me battre pour cette complexité en prônant plusieurs points. D'une part, l'accès aux logements et aux équipements. Il doit se faire depuis la rue. Il est hors de question de monter sur la dalle ou de devoir la traverser pour arriver chez soi. L'urbanisme de dalle c'est justement ça, la dalle qui distribue. D'autre part, la découpe en volume doit être extrêmement claire. Il faut éviter de trop enchevêtrer les surfaces de différents programmes*".[17]

Nonetheless, he points out to other possible solutions that would make the scheme less simplistic than simply slicing the programs, and enhance the character of the building as a mixed use building without compromising its functioning: "*(…) il aurait pu y avoir une plus grande mixité en intercalant, par exemple, entre les surfaces commerciales du rez-de-chaussée et les logements, un ou deux étages de bureaux ou d'activités. Dans le cas précis, il suffisait de mutualiser le noyau de circulation entre les différents programmes. Mais les investisseurs trouvaient ça compliqué et craignaient surtout de ne pouvoir vendre les logements.*"[18]

17 "L'entrepôt Macdonald : une occasion manquée - Entretien avec Nicolas Michelin", *Revue Tracés*, April 2014, p. 24.

18 *Ibidem.*



Source: Author Diagram - based on a+t This is Hybrid, p. 98.

Towards the idea of 'architectural diversity'

In September 2008, the base project for the Entrepôt Macdonald was finally validated. Although two months later the subprime crisis broke out and slowed down the project, the SAS ParisNordEST confirmed the determination to implement the Masterplan and assigned the coordination of the project to the architect Floris Alkemade; the former director of OMA opened his own studio in Paris on that occasion, in collaboration with Xaveer De Geyter, and the two overtook the courageous task of orchestrating the entire operation. "*The plot was divided into sections to build in and above the existing structure*"[19]. After this early phase of the project, 15 architects have been assigned to develop the project, each one being in charge of a different 'slice' of the horizontal volume.

The fundamental concept developed by OMA and Floris Alkemade foresaw the preservation and the enhancement of the austere modernism and horizontal character of the existing industrial building, adding a new volume "*simply designed as a doubling of existing volume*"[20]. This concept endeavored the reconciliation with the formal aspect of a modernism that had "*generated across difficulties, as if it was the antithesis of the sociable city*"[21]. Floris Alkemade was therefore reluctant towards the idea of fragmentation and multiple authorship, which, he though, was opposed to the base principle imagined by OMA – one Big Building with a strong iconic image, capable of generating new dynamics in this zone of the city – "*From our point of view as architects, we found it thought provoking to imagine the entire operation being designed by one single office, not unlike the original logic of the building. Differences in scale and use would be sufficient to create the animation desired.*"[22]. Yet, the idea of the project being developed by one architect wasn't well accepted by the client, as it seems, "Bigness *is the new taboo*" [23].

Many reasons explain indeed the reluctance that the city of Paris expresses against Bigness. On the one hand, there's a sort of ghost that is still very present in the French collective memory: the one of the *grands ensembles* as generators of social issues - an idea that is confirmed by Floris Alkemade: "*La France traîne sans conteste un profond traumatisme lié à la grande échelle, en raison de l'héritage problématique laissé par les grands ensembles. Le phénomène est parfaitement compréhensible et on ne saurait le négliger. Dans notre projet, toutes les tentatives de consolider uniquement la grande échelle en doublant le volume ou en répartissant les programmes supplémentaires dans des bâtiments plus hauts ont été jugés indésirables*

19 Herbert Wright, "Big Mac – Entrepôt Macdonald Paris", *Design Curial*, July 2016, Web source: http://www.designcurial.com/news/big-mac-entrepot-macdonald-paris-4939052/ (17/07/2016).

20 Personal interview with Floris Alkemade, held in February 2014.

21 ParisNordEst, *La reconversion de l'entrepôt Macdonald - Dossier de Presse*, 2009, p. 41; translated from the French: "*Le modernisme a généré partout des difficultés, comme s'il était l'antithèse de la ville conviviale.*"

22 Floris Alkemade et FAA+XDGA, "Cadavre exquis", », *in* Mathieu Mercuriali, *141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald, op. cit.*, p. 217 (pp. 204-225).

23 *Ibidem.*

The facade in 2016 retains the original first floor structure, with new build rising above it, including housing by Christian de Portzamparc above the western end.
Image: Paul Raftery

Model of the entire project
Image: Javier Urquijo

quand ils n'étaient pas tout bonnement interdits" [24]. This kind of reaction is not restricted to the Entrepôt Macdonald, but also to the generality of the urban operations in France – namely multiple ZAC operations –, as mentioned by Jacques Lucan: " *(…) le fantôme du 'grand ensemble' n'en finit pas de hanter les esprits : il apparaît aussitôt qu'un bâtiment fait plus de 30 mètres de long, que quelques fenêtres sont régulièrement alignées, que des balcons filants se profilent*"[25].

The long building has been divided into juxtaposed horizontal slices, and each has been assigned to a different architecture office. The appointment of those 15 architects would be a way of ensuring diversity through the multiplicity of architectural languages. Paradoxically, the coordinating team led by Floris Alkemade and Xaveer of Geyter kept doing everything to resist all forces that were threatening to erode the simplicity and uniformity of the existing architecture. To maintain the unitary appearance of the building and ensure the overall coherence of the project, the coordinators have imposed to the 15 teams a few guidelines. One of them was the preservation of the existing façade, which has, in the end, been demolished and then rebuilt with an identic appearance, becoming a purely ornamental element added to the new construction. Some of the main façades of the new blocks physically fit within a framework of concrete or metal, a meter thick, which delineates the contours of the building. A system is therefore defined for the north facade, less for the south façade (this one is fragmented into different blocks to allow sunlight to reach the courtyard and the inner south façade) and completely frees the team of architects for the design of the interior facades of the courtyard. The rules defined for the north façade were fairly simple, and intended mostly to enhance the horizontality and the unitary aspect of the building as a true Big Building from the side where it has bigger impact: when perceived from the Boulevard Macdonald[26]. They translate into alternating layers of two different types of materials, ranging from mineral materials that absorb the light and crystal materials that reflect it, as for instance the commercial ground floor, whose folded windows act as prism. Each architect was free to define the façade of his or her building as soon as this principle is respected. Nonetheless, several workshops have been realized under the coordination of FAA+XDGA, with the intention of making the design of the different projects work together with some criteria and coherence. The main work tool of these workshops was a large model where each architect could place his/her own realization[27].

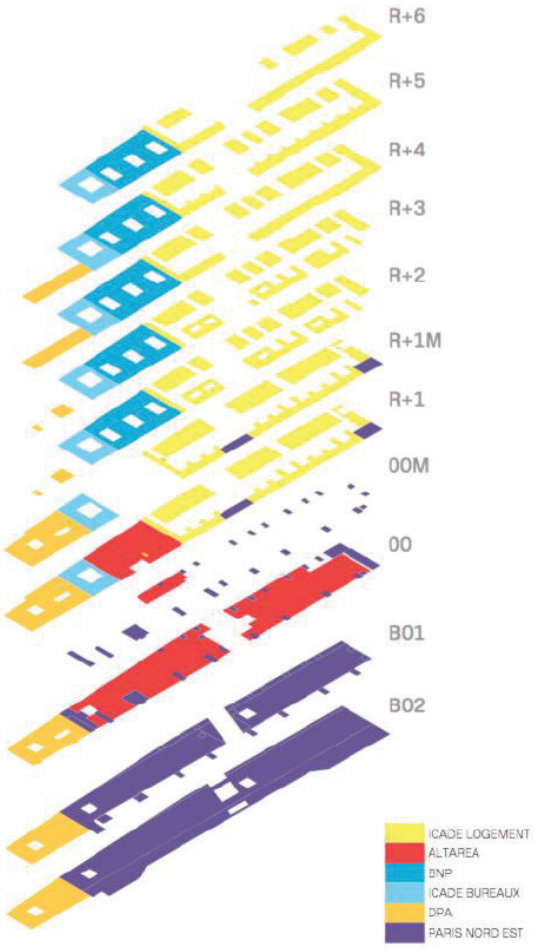
24 "S, M, L et XL - Entretien avec Floris Alkemade", *Revue Tracés*, April 2014, p. 22.

25 Jacques Lucan, *Où va la ville aujourd'hui?: Formes urbaines et mixités*, Editions de La Villette, Paris, 2012, p. 59.

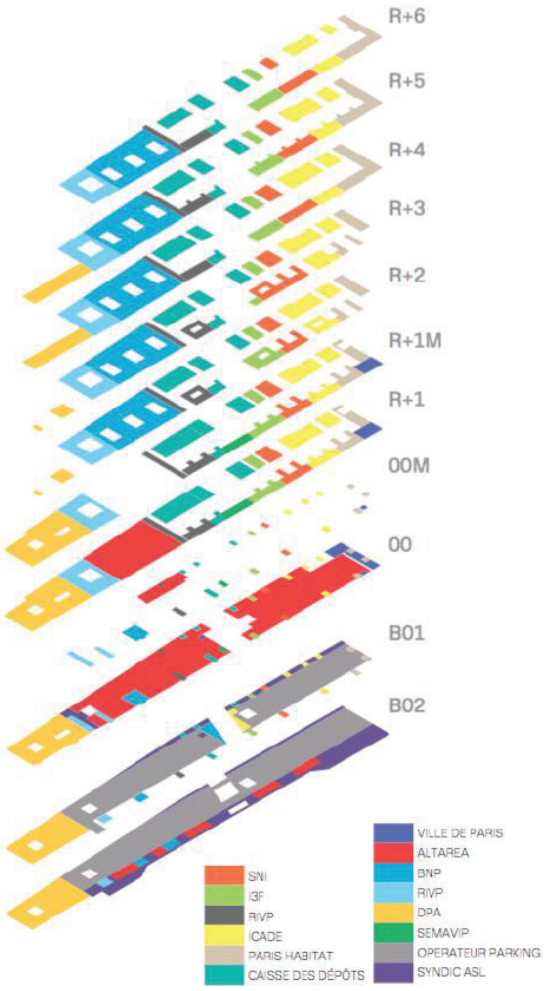
26 These efforts were aimed at concretizing Floris Alkemade and OMA's initial aim – the one of bringing the project closer to the concept of Bigness, mainly through the split of the interior and exterior as two distinct and non-corresponding elements; the outside acts as disinformation agent to the interior - offering the city the apparent stability of an object - whereas the interior would hold the instability of a dynamic organization with unpredictable results.

27 Personal interview with Vincent Héritier (SEMAVIP), held in February 2014 at the Entrepôt Macdonald, Paris.

CONTRACTING AUTHORITY



INVESTORS



Complexity associated to the multiplicity of stakeholders.

Source: Entrepôt Macdonald - Press Kit 2016
(http://www.entrepotmacdonald.com/assets/pdf/macdonald_dossier-de-presse_2016.pdf)

Bigness and Complexity

As we speak of Complexity in the context of the Entrepôt Macdonald, we think less on the complexity of an articulated organism with superposed internal logics, but rather of other types of complexity.

The Entrepôt Macdonald represents indeed a complex hybrid model, as the regulatory framework - urban and legal - in which it operates bears an ambiguous position between the two disciplines. This hybrid encounter of the fields of architecture and urban planning within a building is at the origin of a new form of complexity, which relates to the status of the building. Although its design is confined within the boundaries of an existing building, it is subjected to urban regulations (PLU) just as any urban operation to be planned in the city (which implies respecting maximum heights, building setbacks, etc)[28]. Mathieu Mercuriali, researcher of the Complex Design group, explains how the phenomenon enlightens the idea of building 'city within the city': "*Les échelles urbaines et architecturales se télescopent au sein du processus de fabrication du projet. Ce processus de projet interroge ainsi l'échelle à laquelle peut être pensée la ville aujourd'hui. La reconversion de l'entrepôt Macdonald propose de penser la ville en s'appuyant sur les opportunités que représente un site déjà structuré à grande échelle. Si la décision de détruire l'entrepôt avait été prise, le projet aurait été autre. En ces termes il se différencie des projets pour le Paris intra-muros des années soixante, dont la tabula rasa a généré un saut d'échelle entre le quartier et les nouvelles constructions sur dalle.*"[29].

At the same time, this project of densification of a warehouse raises two additional levels of complexity: technical first, since constructive issues related to the hovering of existing buildings trigger structural, economic and safety challenges; procedural, secondly, due to the integration of a transport infrastructure – the tramway passing in the middle of the building and the connection to the future station of RER and Rosa Parks – all within an intricate mixed program.

This procedural complexity generates a particular form of sophistication in what relates to the financial settlement of the operation. The financing comes from multiple sources and is done through various nested assignments of the building code that involve a myriad of financial and legal adjustments. Semavip and his two partners - Caisse des Dépôts and Icade (grouped within the company Parisnordest) - drive the management of a "dynamique d'enfer"[30] at the level of this gigantic project. Managing this plurality of actors - which proliferates both in project management and in the construction management - is for sure an enormous challenge.

28 This subject has been largely discussed at the Seminar ELGE (Explorer La Grande Echèlle), "La reconversion de l'entrepôt Macdonald, un cas d'étude à Paris", organized by Mathieu Mercuriali, within the scope of activities planned within the EPFL Complex Design group, on the 28th of June 2013, in Paris.

29 Mathieu Mercuriali, *Concevoir à grande échelle – Modèles d'interfaces de mobilité et stratégies de transformations urbaines*, *op. cit.*, p. 301.

30 See Xavier Malverti, "La grande échelle de Rem Koolhaas – De New York à Lille: la ville délire", *Les Annales de la recherche urbaine*, March 1999, p. 14.

Central Square: the largest subtraction of the building forms a generous place at the interface of T3 tramline, the Rosa Parks Station and the Boulevard Macdonald. Skillfully articulating architecture and infrastructure, the old concrete monolith is integrated into the city.

Photo: Cyrille Weiner

The tree urban principles applied to the Entrepôt Macdonald: crossing, subtraction and superposition.

Source: http://www.entrepotmacdonald.com

Another aspect that makes the process of conception of the Entrepôt Macdonald particularly complex is the multiplicity of actors involved in the process: "*La multiplication des acteurs impliqués dans les projets complexes semble en effet induire une diminution des responsabilités de l'architecte. Souvent, ce sont les promoteurs qui définissent eux-mêmes l'avant-projet, augmentant ainsi considérablement leur pouvoir décisionnel dans la planification et la construction. Dans cette configuration, le rôle de l'architecte se limite à coordonner les différents acteurs et se charge de diffuser les intérêts des particuliers ou des sociétés.*"[31].

2.4. The Functional Mix

The base description of the functional mix contained within the Entrepôt Macdonald project is thrilling: *"(…) social housing, student housing, and housing for young workers is cheek by jowl with offices, a business start-up incubator, educational and sports facilities, shops, cafés and restaurants*."[32] With its combination of programs on top of a warehouse that becomes a podium and yet promises remains porous to the city (it is intersected by a tramline and an adjacent public square) it promises to be some sort of *Unité d'Habitation* of the XXI century, or a tower laid down on its own podium, recalling the fantasies of Madelon Vriesendorp's representations of Manhattan[33].

At its base, the project could be said to play with even more thrilling ingredients than the *Unité d'Habitation* itself: a much richer variety of uses and dwelling types, adapted to the dynamism of today's society (*the redevelopment of Macdonald warehouse represents in a concentrated form the new practices and expectations of the Parisian metropolis)*[34]*:* and the intent to bear a much richer settlement and a tighter connection with the city; instead of being only a self-contained city like the *Unité d'Habitation*, it could be a real 'city within the city' a promising model to sustain the idea that a city can grow within its boundaries through a smart exploration of density, aside with the reinterpretation of urban elements like the street (see chapter II) within enclosed boundaries. The idea of exploring the stratification of horizontal bands had an interesting potential – using the existing building as a base and building a new city, with a new scale, on top of it. As such, the building would be, simultaneously, one big building and one small city[35].

Moreover, the horizontal deployment of this building over 617m and its former inner network system (its own internal network of ramps, tracks and docks) would allow us to imagine that its reconversion would somehow recover part of this thrilling interior with circulation tracks linking the different programs. But

31 Marta Brandão, « Variations sur le thème de la complexité à grande échèlle », *Tracés*, April 2014, p. 12 (pp. 10-16).

32 Read more about accesses and public spaces in: Mathieu Mercuriali, *141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald, op. cit.*, p. 305.

33 *Ibidem.*

34 *Ibid.*

35 Personal Skype interview with the FAA project manager Milena Wysoczynska, held in January 2014.

PRINCIPE D'ALTERNANCE EN "SANDWICH" DES MATERIALITES DE FACADES

Marcel Forest's 1970 linear structure and cantilevering volumes of CARGO and AUC's student housing overlook the tram and Boulevard Macdonald.
Image: Paul Raftery

instead, the project explores a rather peculiar way of articulating and superposing functions, clearly separating the public spaces from the private ones. Unlike the projects of 'urbanism on slab' (*urbanisme sur dalle*) there isn't an elevated floor distributing to the different programs. Instead, each program of the mixed ensemble is accessed directly from the street, which is meant to be the place where the multiple different users gather (contrarily to what would be expected from a 'self-contained city'). This is said to be a way of intertwining the building with the urban ground and the city, avoiding the autonomy and isolation triggered by the intimidating appearance of this self-contained object. This principle seems to be reinforced by the crossing of the building with the tramway and the creation of a public square installed around it. Moreover, the access to the parking and the logistical aspects are integrated at the underground level, leaving the street free for the social events to take place. Its ground floor connects with the street and it is possible to pass-through the building in three different points. The largest of these crossing paths provides space for the passage of the tramway line, between the *gare Rosa Parks* and the *boulevard Macdonald*. This articulation of architecture and infrastructure intends to provide a natural tie between the building and the city.

Following this logic of articulation with the city, it was very clear, from the beginning, that retail should be located in close relation with the street. At ground level, the full depth of the building is used, allowing for the experimentation with different types of shop fronts. "*The 80 m depth of the warehouse implied that the shops would have a large surface area. (…) A smaller area of retail was put on the first floor, allowing configuration for a bigger multi-story retail concept*" [36]. A part of the program dedicated to sports and education has been positioned at the eastern side of the building, enabling the creation of an inner playground that brings light to the inside of the building. Yet the biggest chunk of the project is reserved to offices and mainly, housing (representing 50% of the program). Being interested in a real mixture of functions, the architecture team did some tests that would mingle the two programs, yet the difficulties and conflicts generated by the act of mixing the two programs within one building with shared accesses allegedly created more problems than advantages. Bearing in mind that the interest of mixing programs is the animation generated at the ground level, the design approach has been modified: "*Above the retail units we orchestrated a sequence of aligned activities – offices and apartments, and made sure that all the entrances were connected to a communal public esplanade*." [37] Offices have been located at the central part of the building, organized around small patios to compensate the depth of the building allowing light in. The services are located at the underground base, where vast parking areas are conciliated with a delivery road that supplies the large number of shops and offices, hiding the trucks and loading bays from the street and reinforcing what seems to be a priority of the project: the animation of the street. This strategy isn't applied to many Big Buildings (and is somehow dissonant with the Bigness theory which defends the autonomy of the object – see chapter II). Big Buildings do not usually bear this effort to connect and articulate with the street and the city, or

36 Floris Alkemade et FAA+XDGA, "Cadavre exquis", », *in* Mathieu Mercuriali, *141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald, op. cit.*, p. 211 (pp. 204-225).

37 *Ibidem.*

Flagrant delit, 1975 (Version II), Used for the cover of Rem Koolhaas's book Delirious New York: A Retroactive Manifesto for Manhattan.

Source: Madelon Vriesendorp; published in Marta Brandao, « Variations sur le thème de la complexité à grande échèlle », Tracés, April 2014, p. 14.

Housing in the North façade

Source: http://www.entrepotmacdonald.com

Photo: Cyrille Weiner, 2015

to "humanize the scale of the building" [38], normally acting rather as clusters, as catalysts, and holding their own complex articulated mixed systems within their volumes.

Broken connections – complex goes complicated

Yet the truth is that nothing in Macdonald seems to trigger these unpredictable internal dynamics. Despite the multiplicity of programs and the typological mix, used as strategy to activate the establishment of forms of social diversity, the different parts of the building remain disconnected from one another. Is this really one Big Building or, instead, a set of juxtaposed independent buildings, each with its own individual access from the street?

Even the interior courtyard that could have become a great communal garden, connecting the different buildings and inhabitants, will not be accessible. Despite numerous efforts, the most interesting of all crossable areas has simply been made forbidden by the operators that there weren't capable to see beyond the high maintenance costs and potential privacy problems.

If above we have seen that it remains unlikely that De Rotterdam will become the wild and dynamic organization that Koolhaas proclaims in the manifesto of Bigness, the Entrepôt Macdonald does not seem more likely to succeed. This project that envisioned a real mix of programs, of social logics and neighborhood relationships is in the end no different from any *macrolot* "*à la française*", bearing an increased privatization of shared spaces and wherein only the street, outside the project, functions as a potential social space.

Thus, if we define complexity as "*a tissue of heterogeneous parts inseparably associated*"[39] this logic of connectivity and flow does not seem to have been accomplished in the new architecture produced inside of the old Entrepôt. What could have become a multipurpose building of exceptional magnitude will ultimately be no more than a juxtaposition of conventional independent buildings, a collage of different architectural languages, artificially bound by the remnant of the past.

Although the overall scale of the project that could embody the 'new sort of architecture' defined by the manifesto of Bigness, the conservatism and economic interests of the developers seems to have destroyed the points that could have transformed the building in a social catalyst. What remains, in the end, is this complexity that comes from the numerous production processes.

38 Read more in Floris Alkemade et FAA+XDGA, "Cadavre exquis", », *in 141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald, op. cit.*, p. 206 (pp. 204-225).

39 Edgar Morin, *Introduction à la pensée complexe*, Editions du Seuil, Paris, 2005, p. 21 (translated from the french by the author).

Passage of the tramline under the Entrepôt Macdonald
Photo source: Grazia

North-Shouth section through the building showing parking (underground), a commercial base on the full footprint of the building, housing (with varied apartment typologies) and the central courtyard.
Source: Courtesy of FAA – XDGA

2.5. The concept of living at the Entrepôt Macdonald

Aside with its wealthy functional mix, the Entrepôt Macdonald bears a clear preoccupation with offering a wide range of dwelling typologies, being that 50% of those dwelling units are assigned to social housing[40]. In this sense, the housing approach seen in this building is definitely very different from the one seen in the first case-study, De Rotterdam. What we will henceforth try to understand is whether the Entrepôt Macdonald bears a more cherished exploration of the concept of 'housing in the Big Building' if it remains within a conventional approach.

The total area of housing included at the Entrepôt Macdonald is 74'000 m^2, from which 50% corresponds to social housing, 25% to rental and 25% to sale. The total 37'000 m^2 of social rental (246 dwelling units) includes also housing for young workers (mainly small studios) and also a student residence. From this basic description, one can deduct that a considerable social variety could be associated to these schemes, that attract students and young workers, but which might also be seducing for business workers (due to the amount of companies established in the area) or families with children (lured by the comfort of benefiting from educational/recreation programs within the complex).

The real mix of social types (social housing with rental/for sale) is never completely entropic. Although, if we consider the total volume of the Entrepôt Macdonald, the different housing types are alternated in a rather balanced way, the truth is that each different housing type is placed inside its own specific building, designed by one particular architect with its proper architectural language. If on the one hand it is true that dwellings for sale are located only a few meters aside social housing, and are accessed from the same street, sometimes even having vis-à-vis contact, the truth is that, apart from the street and, potentially, the commercial and educational services, there is not much chance for the inhabitants to get to interact with one another within this Big Building.

General architectural strategy

The design strategy of the Entrepôt Macdonald has determined housing to be located at the west wing of the building and distributed along two parallel bands, with an open private garden in the middle, placed at the rooftop level of the commercial base. This strategy allegedly allows each dwelling to have a façade oriented towards the buzz of the city and a calmer one, with views over the inner garden[41]. Studying the views from the housing area to multiple different points of the city of Paris has been a key priority for the design team[42], but the solar orientation north-south was particularly challenging with this two band strategy, as one of the bands would be in shade; this somehow justifies the porous altimetry of the volumes containing housing. As a form of avoiding the massiveness of

40 Following the French regulation that requests the inclusion of 50% social housing in every new urban development.

41 Skype interview with the project manager Milena Wysoczynska, held in January 2014.

42 *Ibidem.*

Kengo Kuma's college and sports facility (left) and Studio Odile Decq's CARGO start-up offices (right) rise above tramline T3 at the eastern end.

Image: Paul Raftery

South side facing Rosa Parks station, west to east.

Source: Matthias van Rossen (http://www.entrepotmacdonald.com)

the building towards the boulevard, the idea of exploring a free-arrangement of blocks on top of a continuous base has been the theme explored amidst the different architects in charge of the design development of the housing areas – a stratification of recesses and cantilevers that has been explored by most architects. At the lower levels, attached to the façade of some apartments, the façade of the old building is rebuilt, in an effort to preserve the 'one building' idea, sustaining the wide variety of designs planed on top of it: "(….) *the existing warehouse building can be read as having two strata. On the ground floor, where the truck docks used to be, the façade consisted of an ongoing series of story-high openings to give a direct access to the vast floors in the building. Cantilevered above is a second stratum with the characteristic façade formed by the concrete grille. It is this layer that truly defines the architectural presence of the existing building.*"[43] This artificial rebuilt façade triggers some strangeness in points where it is in front of the living areas of some apartments, as the offset reveals a fragile attempt of articulation of the two scales.

Planning housing within density and extreme restrictions

The distinction between the different housing categories explored within the project is not very clear, as almost all the housing volumes deal with one and the same challenge: the one of building the best possible architectural quality within a scenario of maximum densification and severe cost restrictions. Although differences might be acknowledged between material finishes, the fact that the architectural languages are so different from one another somehow dilutes any possible differentiation between the different housing standards. A person who observes the building from the outside could hardly decipher which parts are social housing or not.

Nicolas Michelin, responsible for the projects of a percentage of apartments for sale, explains the difficulties he had to face with the developers wanting to have the maximum profit with extremely small areas and reduced linear façade: "*Notre projet devait répondre à des critères technico-économiques complètement terrifiants. Par exemple, le rapport très faible entre la surface de façade et la superficie de l'appartement. Les logements sont petits mais en plus, le linéaire de façade est limité. Et ce n'est pas tout, la quantité de vitrage est elle aussi limitée. Apparemment, il y avait pas mal d'argent prévu pour les façades, ce qui est assez révélateur. Les promoteurs favorisent l'aspect extérieur des bâtiments – le wow effect – plutôt que le respect d'une trame existante ou la générosité des surfaces habitables, l'usage. Le cahier des charges d'ICADE dans lequel figure toutes ces exigences est une machine de guerre, la moulinette des promoteurs pour faire un projet économique, mais pas de l'architecture*"[44].

43 Floris Alkemade et FAA+XDGA, "Cadavre exquis", *in 141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald, op. cit.*, p. 223 (pp. 204-225).

44 "L'entrepôt Macdonald : une occasion manquée - Entretien avec Nicolas Michelin", *Revue Tracés*, April 2014, p. 24.

Viewed from the south, Hondelatte and Laporte's housing (left) forms an internal gap with AUC's student housing (right).
Image: Paul Raftery

A garden is planted above the car park in the central axis. FAA+XDGA's office bridge and residential blocks are seen beside and beyond it.
Image: Paul Raftery

Retail on the southern side, below (from right) blocks by Habiter autrement, Julien de Smedt (JDS of Brussels) and Stéphane Maupin, with others further west.
Image: Paul Raftery

« *Nous avons fait plusieurs recherches de volumétries successives pour réussir à compacter au maximum. Finalement, nous sommes parvenus à une solution intéressante qui propose un système de pentes inversées. Ça anime les façades et permet à chaque propriétaire de bénéficier d'un balcon orienté au sud. Nous avons réussi à concevoir des appartements traversants, mais on voit bien qu'il y a des rapports entre le linéaire de façade et la surface habitable parfois très tendus.* » [45]

Indeed, some of these apartments are really small in terms of their total surface; a T3 can have only 60m² or a T2, only 42 m². And although the Entrepôt Macdonald is a truly exceptional building, due not only to its scale but to its character of reconversion, the housing that is produced within the building is similar to the one built in any other ZAC operation, and the views, shared spaces and interactions that could have the potential to emerge there, are even poorer than what is observed in other recent urban operations in France. "*C'est le même cahier des charges que lorsqu'il s'agit d'une opération de logements neufs, mais il n'est pas approprié à un projet de reconversion. Les logements en accession auraient pu être construits n'importe où, dans n'importe quelle ZAC.*" [46]

Ironically, some projects of social housing seem to bear less difficulties in their planning, benefiting from a larger linear extension and from less pressure from the investors to fit more apartment units within very small footprints. Gigon Guyer explain the idea of designing housing as a piece of a whole: *"Il était clair pour nous dès le début qu'en considérant tous les paramètres du projet global, nous ne pouvions faire qu'une ébauche qui admettrait les objectifs et s'inscrirait précisément dans le projet d'ensemble. En ce sens, notre projet est, comme tous les autres, un nouveau bâtiment posé sur l'édifice existant, avec un type d'habitations propre. Toutefois, il était aussi important que cela reste un projet autonome, qui puisse justement apporter une contribution différente. Notre projet se déploie donc comme un bâtiment autonome tenant compte des objectifs urbanistiques du projet global et des contraintes liées au logement social. Le plan en peigne avec les noyaux désenclavés à l'intersection du bâtiment principal et de celui à cour produit un grand linéaire de façade, ce qui génère des configurations judicieuses d'habitations variées avec des orientations optimales."* [47]

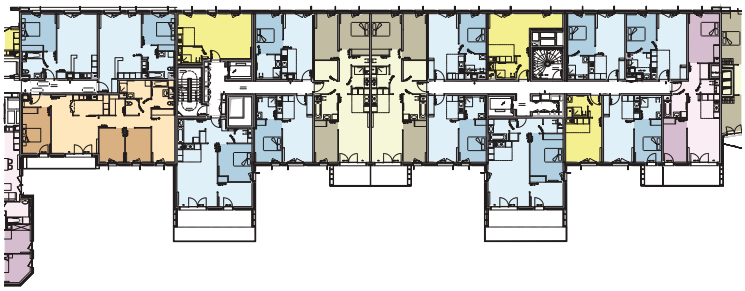
The absence of shared communal areas

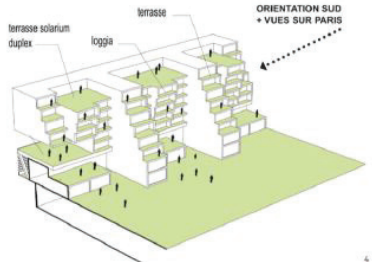
Besides the topic of its non-use, the inner courtyard between the apartments bears small dimensions. Its maximum width is about 30m and, in some points, there's less than 20m distance between the 2 opposed façades which, despite respecting the urban regulations imposed for this building, seems rather small considering the 7 story façades on each side (from the interior of the courtyard). The fact that some volumes are recessed and cantilevered somehow helps reducing the feeling that the courtyard is small, but the vis-à-vis situations are easily understandable when one is on the site. « *C'est impossible de faire quelque chose de correct sans créer*

45 Ibidem.

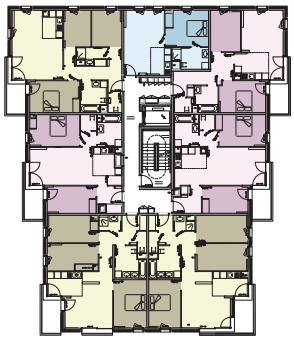
46 *Ibid.*

47 "De l'autonomie dans l'uniformité - Entretien avec Gigon/Guyer", *Revue Tracés*, April 2014, pp. 30-32.

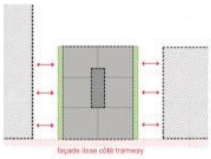


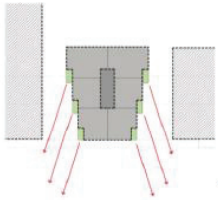


SOCIAL HOUSING



HOUSING FOR SALE





7 Plan étage courant (bâtiment S1)
8 Vue de la façade sud du bâtiment S1
9 Une volumétrie de terrasses tournées vers le sud et Paris (bâtiment S1)
Les documents illustrant cet article ont été fournis par l'Agence Nicolas Michelin & Associés (ANMA).

Two different building typologies designed by ANMA
Source: courtesy of Nicolas Michelin & Associés (ANMA).

de vis-à-vis. Nous avons donc trouvé un moyen de sculpter les façades de sorte que chaque logement bénéficie d'une vue au sud tout en limitant au maximum les vues directes chez les voisins. Cela génère des terrasses intéressantes qui sont accessibles par la chambre ou le séjour."[48]

Parking

At the Entrepôt Macdonald, the parking is fully located in two underground floors. The loading to the commercial zones is also done underground, so as to reinforce the close bond that the building wishes to establish with the street and with the new public squares that are created in the building's borders. It its therefore likely that a large majority of the inhabitants will, most of the times, reach the building by car and take a direct lift to their home door. Unlike the parking at De Rotterdam, in this building, the parking area has just a simple dull character of an artificially lit car park with approximately 700 parking places[49].

The non-exploration of the horizontality (in a 600 m length building…)

Another aspect that is paradoxical in the overall design strategy of the building is the fact that, despite its description as a 'horizontal city within the city', there's an almost total absence of the exploration of horizontal logics within the building, which could easily have been explored on the housing side. Despite built on top of an existing, massive and unitary building, the project has been transformed into a series of small juxtaposed buildings, each with its own independent access directly from the street through a sequence of forward-shifted cores. Although in the first design studies the cores were on the north side, providing also access to the housing blocks on the south side, via a route through the garden on top of the commercial spaces, because of logistic factors, this dual use of the core proved to be difficult. In the end, each housing building has its own core directly from the street. Consequently, the entire perimeter of the building is punctuated with a series of entrances. At the same time, the RER station has a new square with shops and housing entrances.

Structure and Flexibility

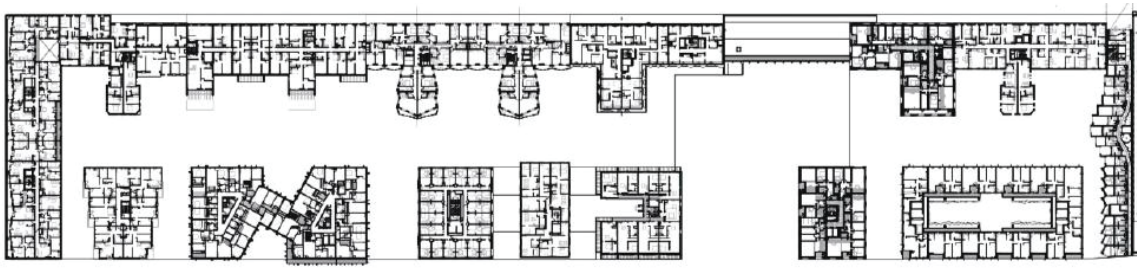
The original reinforced concrete structure of the Entrepôt Macdonald is basically a mat of columns distributed along a grid of 8.50 x 8.50 m and a coffered floor, with the capacity to support not only heavy loads of goods[50], but also the potential addition of new floors. As mentioned above, the initial scheme has indeed left open the possibility for future transformations. Nonetheless, it is curious to state that, in the new architectural scheme - built on top of the existing structure - the

48 "L'entrepôt Macdonald : une occasion manquée - Entretien avec Nicolas Michelin", *Revue Tracés*, *op. cit.*, p. 24.

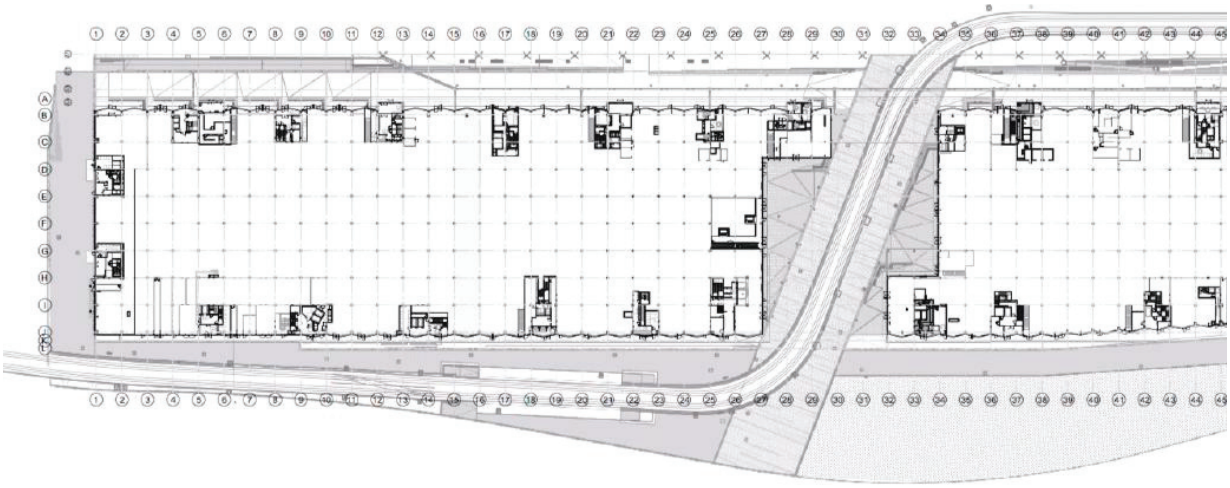
49 "*L'ensemble s'élèvera sur l'ossature du bâtiment existant de plus de 617 mètres de long et de 45 à 68 mètres de large qui accueillera 32 500 m² de nouveaux commerces ainsi qu'un parking public souterrain d'environ 700 places*". Source: https://www.realestate.bnpparibas.fr/bnppre/es/property-development/master-projects/actualites/l-operation-macdonald/zenora-p_1596989.html (17/07/2016).

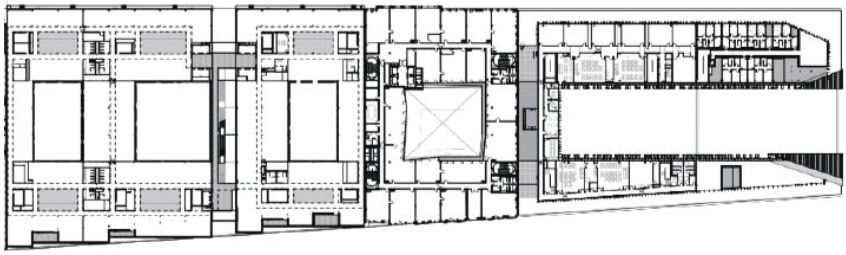
50 Source: http://www.lemoniteur.fr/articles/entrepot-macdonald-un-cadavre-exquis-a-l-echelle-urbaine-31666635 (17/07/2016).

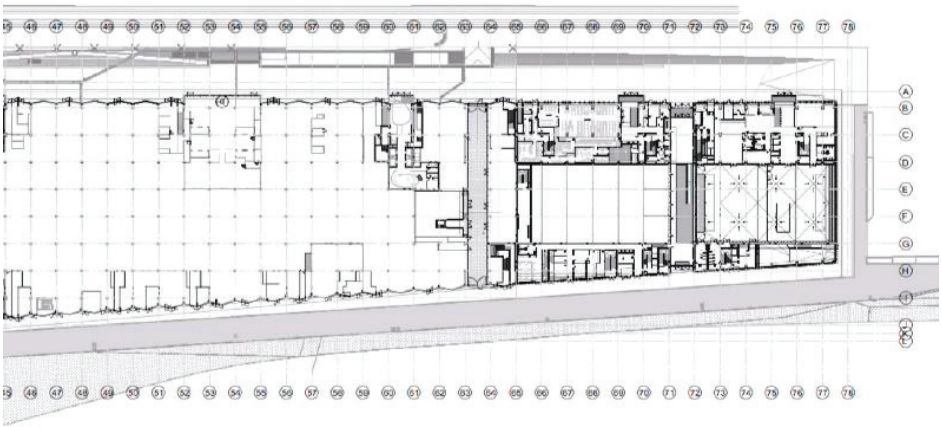
FOURTH FLOOR PLAN

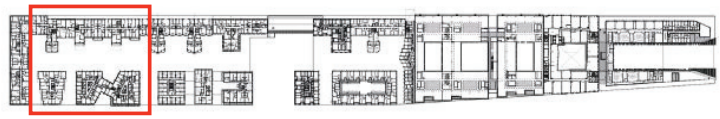


GROUND FLOOR PLAN



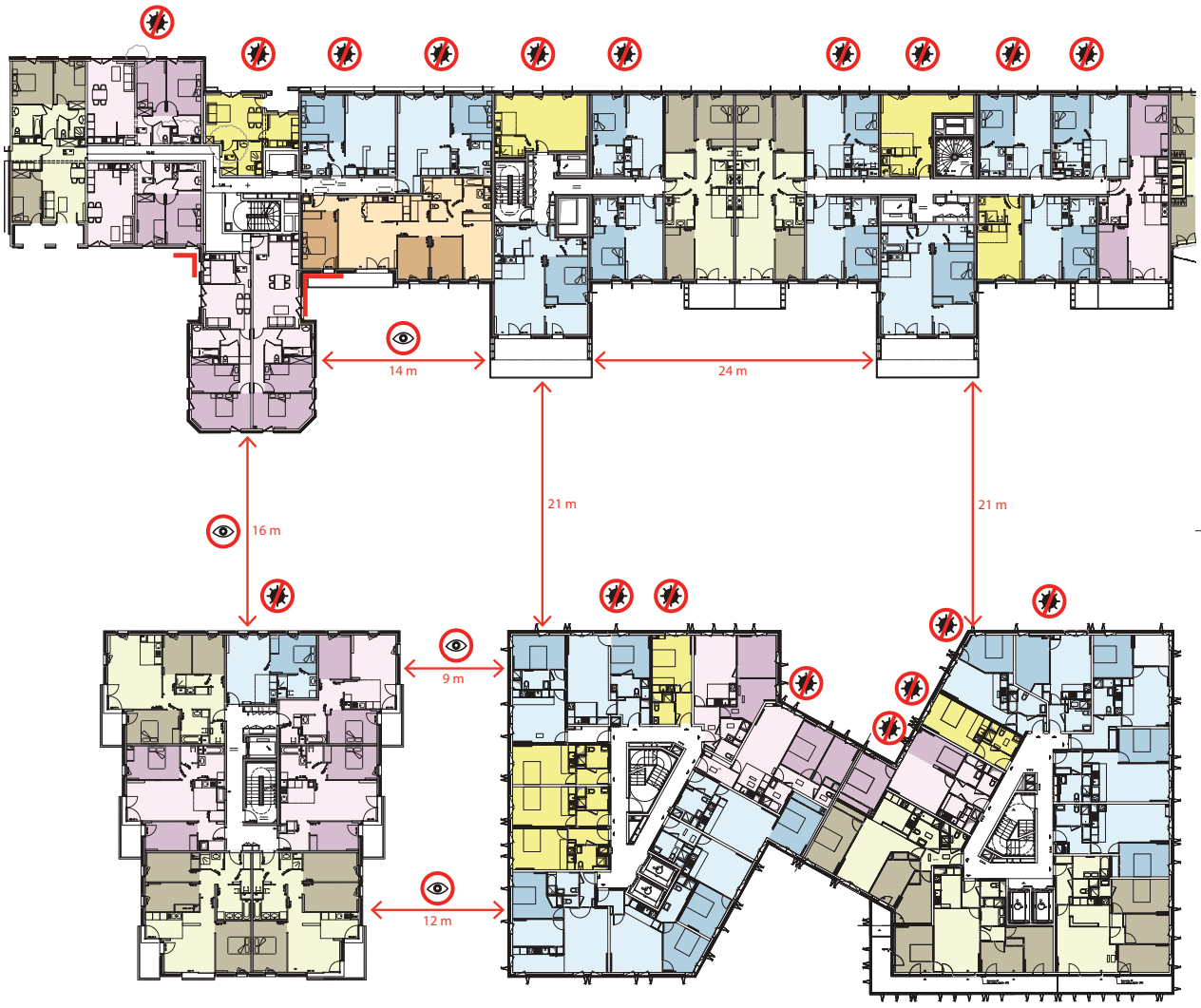






PORTZAMPARC
Social (45)

ANMA
Logements en accession (90)



ANMA
Logements en accession (50)

BRENAC & GONZALEZ
Logements en accession (138)

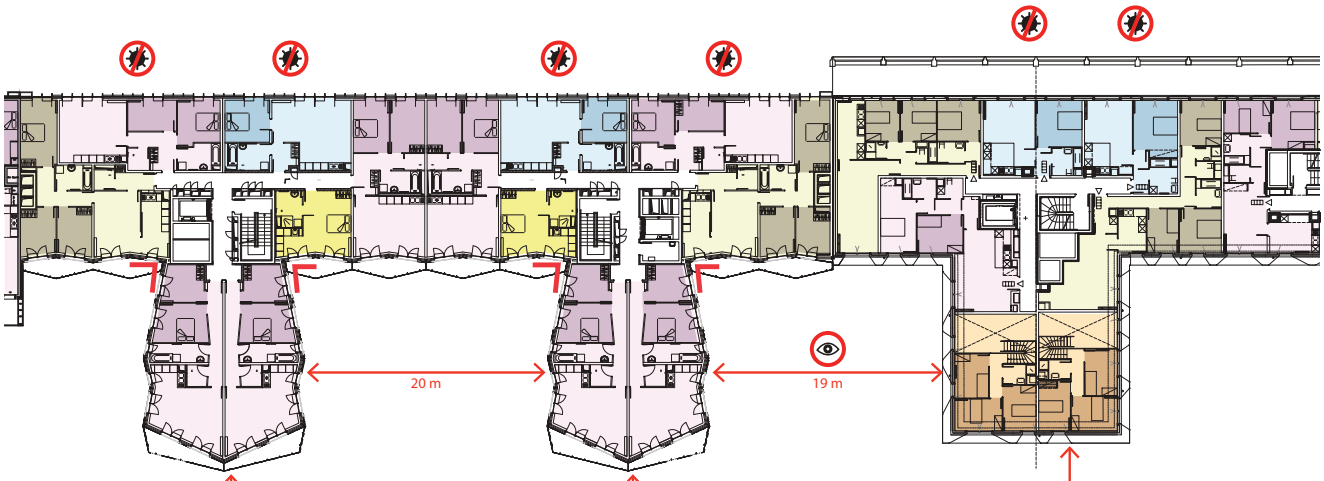
0 1 2 3 4 5 10 meter N

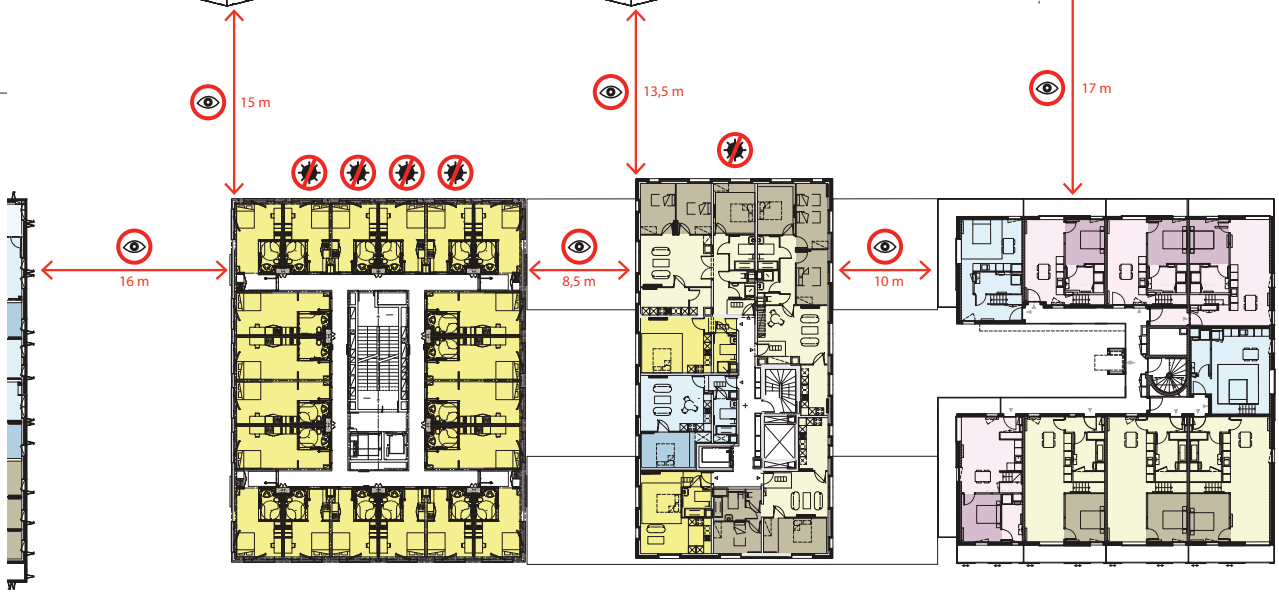
STUDIO
1 BEDROOM
2 BEDROOM
3 BEDROOM
4 BEDROOM

VIS-A-VIS ISSUES <20m
ORIENTED NORTH

GIGON GUYER
Social (84)

JULIEN DE SMEDT
Social (61)

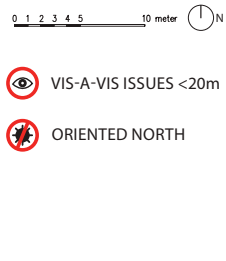


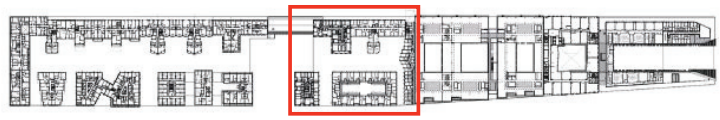


STEPHANE MAUPIN
Foyer jeunes travailleurs (126)

JULIEN DE SMEDT
Social (33)

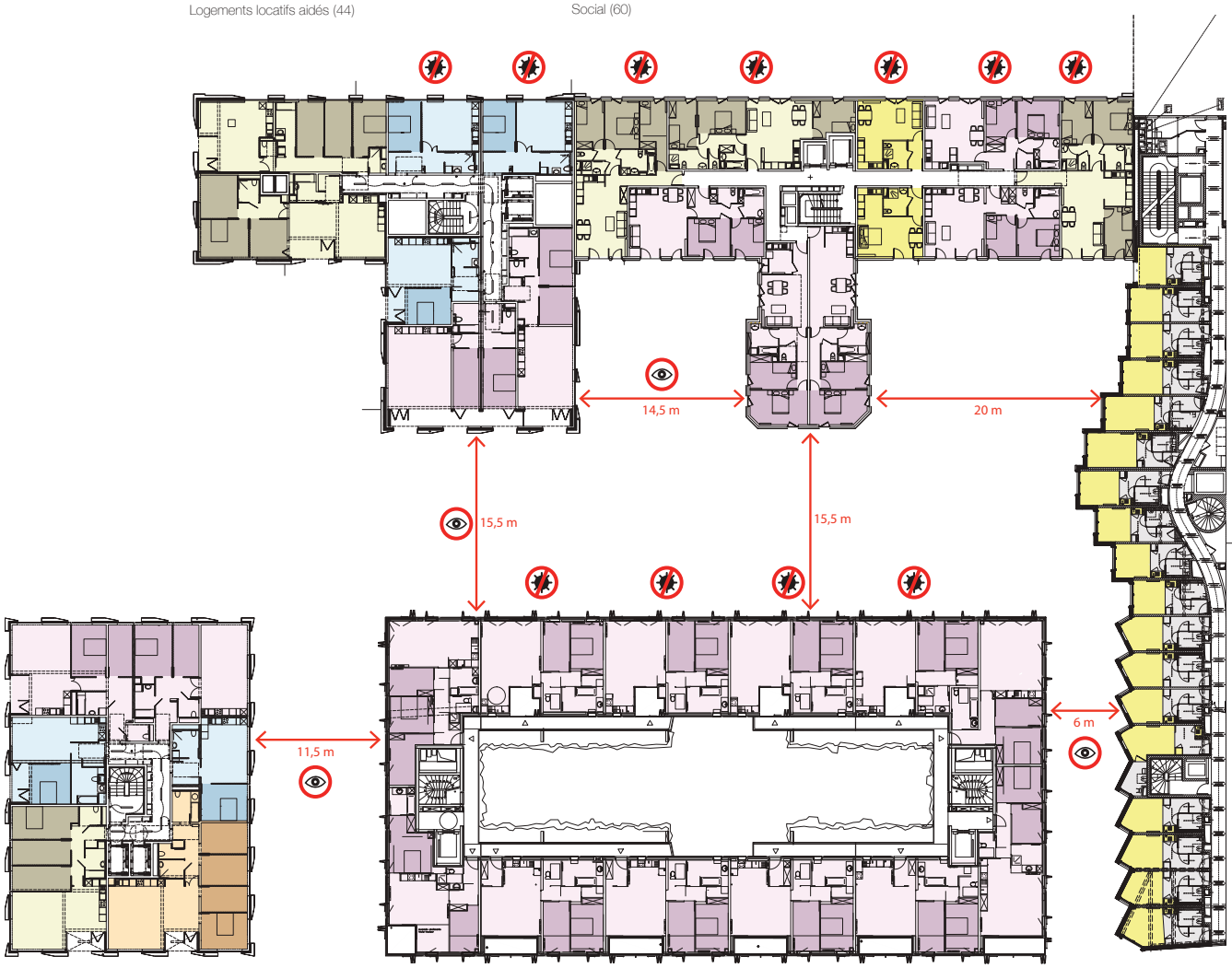
HABITER AUTREMENT
Locatifs aidés (42)





XDGA+FAA
Logements locatifs aidés (44)

PORTZAMPARC
Social (60)



XDGA+FAA
Logements locatifs aidés (44)

RAPHAELLE HONDELATTE & MATHIEU LAPORTE
Logements locatifs aidés (82)

AUC
Étudiants (147)

0 1 2 3 4 5 10 meter N

STUDIO
1 BEDROOM
2 BEDROOM
3 BEDROOM
4 BEDROOM

VIS-A-VIS ISSUES <20m
ORIENTED NORTH

different programs have been treated with different structural solutions: the offices have been built with a steel-framing elevation that respects the original structural grid of the old warehouse; for the housing sector, though, a system of reinforced concrete has been superposed to the existing structure, through the insertion of a distribution slab between the lower levels of the warehouse and the housing floors above. Later, each small juxtaposed housing block has been attributed its own specific structural solution. It is curious to state that a scheme that has initially been conceived within a megastructural logic, aiming at remaining flexible and adaptable, has turned into a model of intricacy and irregularity, in which the new construction - bearing multiple different juxtaposed structural grids - endures limited potential to a comeback of the large open spaces.

The planning of housing at the Entrepôt Macdonald

If we take a closer look at the different housing typologies, the strategies applied on their conception and the way they relate to one another, we will rapidly identify a substantial number of fragilities.

If we first analyse the building in terms of sun exposure, with the fragmented façade being oriented south, we understand that, although there has been an effort in the sense of leaving gaps in the south façade in order to allow sunlight to penetrate and illuminate the inner courtyard and the opposed façade stripe, we will verify that the two blocks that surround the patio contain a large quantity of apartments that are exclusively oriented north. Moreover, some of there apartments we are referring to, in the south wing, are oriented exclusively towards the patio (see diagrams).

That wouldn't be a problem if the patio was more generous, yet a quick analysis allows us to understand that the distances between the opposed façades are rather small, ranging from 15 to 21 meters, which is not much if we consider the 6-7 floor band on each side. But the places where this issue might be more problematic are the separated block in the south wing. We can observe that in some particular points there's a setback of only 10 meters, and the worse is that the living area of one apartment and the bedroom of the other in a face-to-face situation that may become uncomfortable. This same situation can be found in many other points of the building (see diagram).

The typological variety that can be found within the building is undoubtedly big, bearing a balanced number of studios, 1-bed, 2bed, 3-bed and a few 4-bed apartments. We have decided to restrain our analysis to the main observations relating to housing and not look into each dwelling typology in particular. The truth is that the typologies found at De Rotterdam are quite generic and bear configurations seen already in other buildings, except maybe that the areas are generally very small. The two buildings that look slightly more generous are the ones designed by the office Habiter Autrement, bearing only duplex apartments, with double heights in the living areas and Gygon & Guyer's building, where one can recognize a bigger effort towards having through apartments, with north and south façade with the living areas normally oriented south towards the patio.

Hondelatte and Laporte projected palms over the courtyard defined by their block.
Image: © Paul Raftery

The central (inaccessible) garden between the housing blocks.
Image: © Paul Raftery

2.6. What is exceptional about living at the Entrepôt Macdonald?

Having gone through the overall analysis of the building, it is imperative to conclude with the central purpose of our research, questioning in which ways inhabiting the Entrepôt Macdonald - a multifunctional, exceptional and dense Big Building – may be capable of engendering innovation and new logics in the concept of high density living. Although the interest and thrill of living in a multifunctional environment - nearby schools, retail, offices, restaurants and all-day-long street liveliness - might turn the experience of living within this building stimulating, aside with the comfort of a privileged connection with important transportation networks (RER and T3 Tramway line), the truth is that there isn't such a significant difference between living at the Entrepôt Macdonald or in any other ZAC operation recently built in Paris. On contrary, if there were to be any difference, it would be for worse since the density is indeed extreme at Macdonald, and the setbacks between the housing blocks are rather compressed (with the dwelling façades bearing tight proximity), but also because there's no accessible green space or any other kind of exterior communal area, comprised in this building (unlike what happens in the majority of the ZAC operations[51]).

The expression 'city within the city'[52], largely used for the propaganda of the Entrepôt Macdonald, is therefore easily undermined from the moment one understands that there isn't any sort of internal 'urban logic' whatsoever linking the different programs or housing typologies internally; even the central courtyard cannot be accessed by the inhabitants.

Unlike what we have seen in examples like the Barbican or the 8 House (see chapter II), where a true complex system of connections (walkways, ramps, stairs) between levels, programs and different housing typologies, allowing the building to function like a true 'city within the city', any possible contact between uses and users at the Entrepôt Macdonald depends directly on the surrounding streets. One may understand the intention of articulating the building with the city, but we believe that this could still happen if a set of wealthier interior logics had been explored. Referring again to the Barbican example, we have seen that it works in terms of its internal logics and well-defined boundaries, as much as it attracts users from other points of the city. But other recent examples prove the same idea; Steven Holl's Vanke centre, for instance, (see chapter II) bears a horizontal deployment of programs which is very similar the one of the Entrepôt Macdonald, and yet the programs are connected by a semi-public interior path that links a series of interior 'nodes' that act as community spaces. At the same time, unlike the case of living in other Big Buildings like De Rotterdam or the Elbphilharmonie, where one had the perception of inhabiting an object and where other uses could be accessed without leaving the building, living at the Entrepôt Macdonald may be just like living in a normal housing neighborhood - each regular housing building accessed directly

51 For instance the ZAC Claude Bernard, right in front of the Entrepôt Macdonald, has more space between the housing blocks and includes accessible green areas for the users.

52 Floris Alkemade et FAA+XDGA, "Cadavre exquis", », in 141-221 boulevard Macdonald 75019 Paris, Reconversion de l'entrepôt Macdonald, op. cit., p. 210 (pp. 204-225).

The central (inaccessible) garden between the housing blocks.
Image: © Hannah Darabi

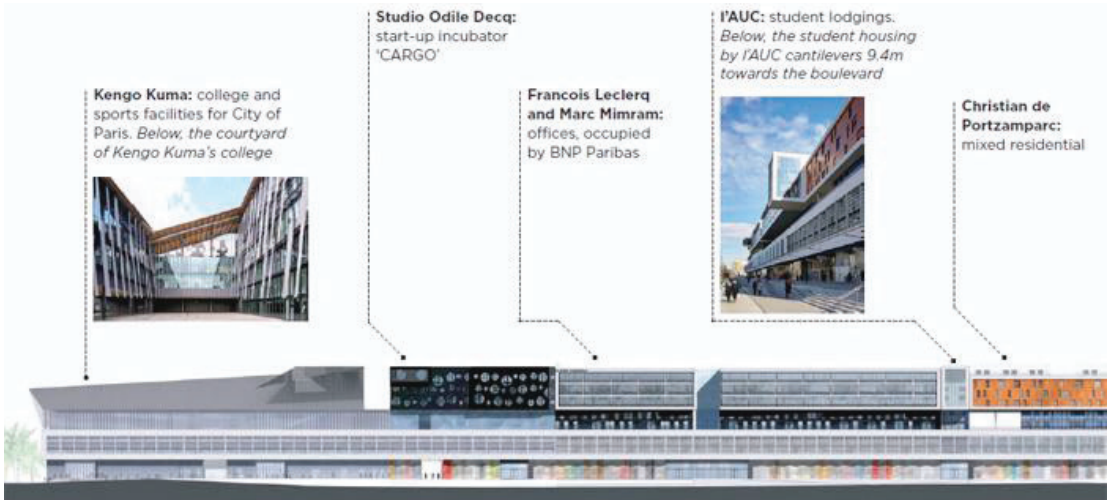
from the street. In this project, even more than at De Rotterdam, we see that the design intents of the architects are completely controlled by the will of the developers and investors. The architect becomes a coordinator between the multiple different stakeholders and, instead of reaching a result of thrilling architectural complexity, the ensemble becomes a complicate and eclectic amalgamate of standard housing buildings juxtaposed to one another, offices and equipments.

From a truly exceptional potential to a speculative outcome

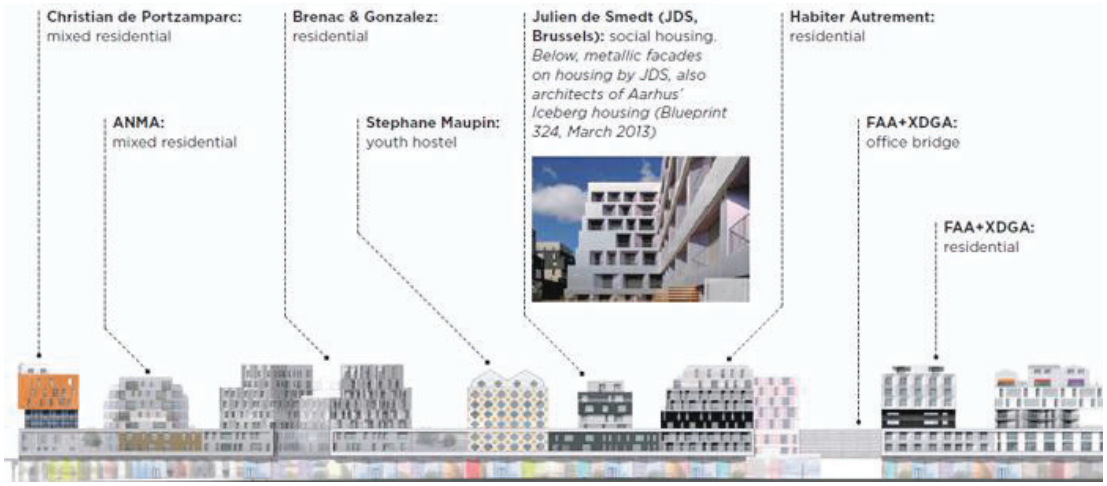
Although, because of the socially engaged nature of the housing program and the typological mix that was proposed on the base brief of this project, and thus the potential to do something truly exceptional within a context of high density would make us expect a truly innovative result, we seem to end up with just another speculative result. This one is of course very different from the housing types seen at De Rotterdam, yet the benefits from living in a Big Building are even fewer. The idea of a 'missed opportunity' (*une occasion manquée*) is enhanced by Nicolas Michelin: "*Je pense que les friches industrielles ou portuaires sont des occasions extraordinaires – si on ne fait pas de tabula rasa – pour sortir des standards. Il faut donc se battre pour conserver ces friches de manière à générer une ville différente qui s'appuie sur cet existant. En ce sens, l'entrepôt Macdonald est vraiment le contre-exemple. Ce n'est un grand projet de reconversion, c'est un grand projet spéculatif.*"[53]

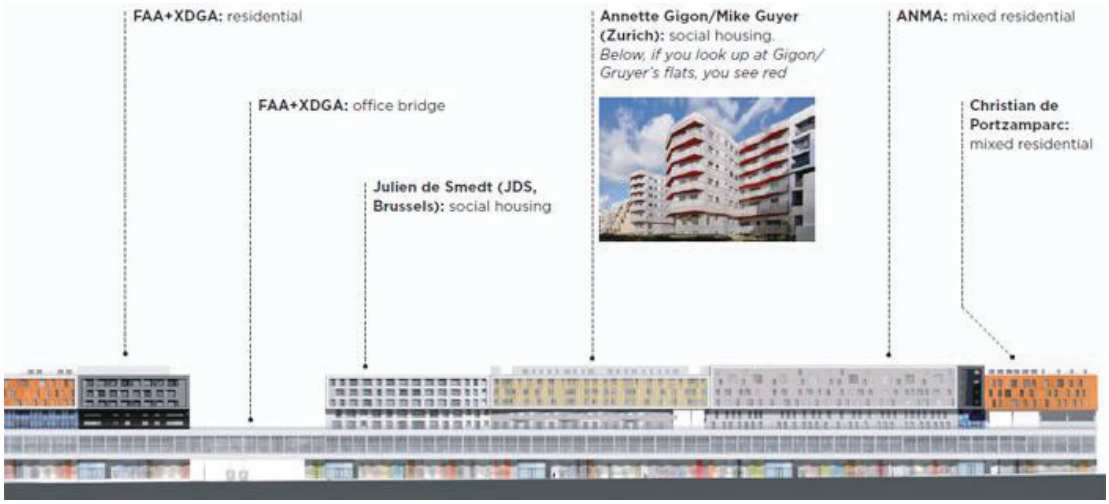
53 *Ibidem.*

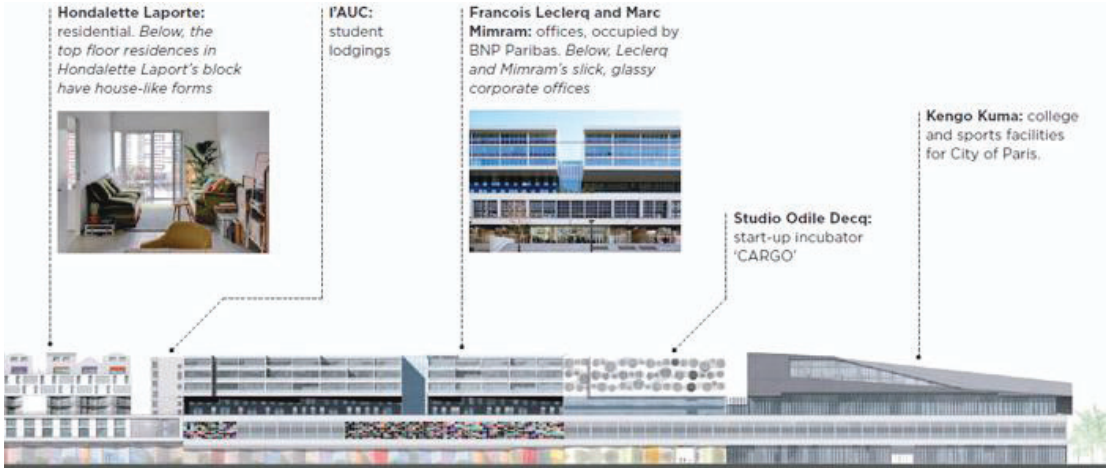
NORTH SIDE FACING BOULEVARD MACDONALD, EAST TO WEST



SOUTH SIDE FACING ROSA PARKS STATION, WEST TO EAST

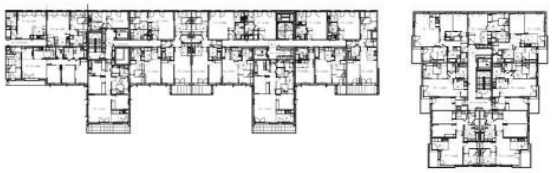



FAA+XDGA: residential
FAA+XDGA: office bridge
Julien de Smedt (JDS, Brussels): social housing
Annette Gigon/Mike Guyer (Zurich): social housing. *Below, if you look up at Gigon/ Gruyer's flats, you see red*
ANMA: mixed residential
Christian de Portzamparc: mixed residential


Hondalette Laporte: residential. *Below, the top floor residences in Hondalette Laport's block have house-like forms*
l'AUC: student lodgings
Francois Leclerq and Marc Mimram: offices, occupied by BNP Paribas. *Below, Leclerq and Mimram's slick, glassy corporate offices*
Kengo Kuma: college and sports facilities for City of Paris.
Studio Odile Decq: start-up incubator 'CARGO'

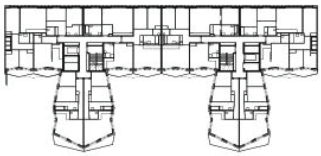
ARCHITECT: C. PORTZAMPARC
N1 - 45 SOCIAL HOUSING
N6 - 60 SOCIAL HOUSING
O1 - 78 SOCIAL HOUSING
1 CRECHE
AREA 12 400 M2 (860 M2
CRÈCHE AND 400 M2 GARDEN).

ARCHITECT: ANMA
N1 BIS : 20 SOCIAL HOUSING
N2 : 90 HOUSING FOR SALE
S1 : 50 HOUSING FOR SALE
AREA 11 047 M2

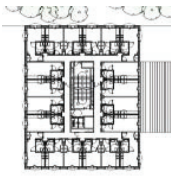


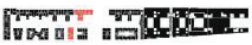
ARCHITECT: BRENAC GONZALEZ
S2 : 138 HOUSING FOR SALE
AREA 8 000 M2

ARCHITECT: GIGON GUYER
N3 : 84 SOCIAL HOUSING
AREA 10 855 M2

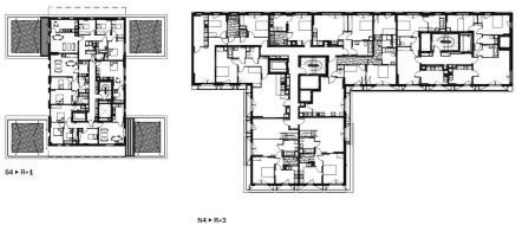


ARCHITECT: JULIEN DE SMEDT
S3 :126 STUDIOS FOR YOUNG WORKERS
AREA 3450 M2

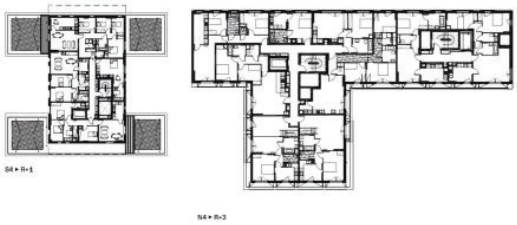




ARCHITECT: JULIEN DE SMEDT
N4 : 61 SOCIAL HOUSING
S4 : 33 SOCIAL HOUSING
AREA 3618 M2



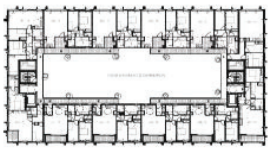
ARCHITECT: JULIEN DE SMEDT
N4 : 61 SOCIAL HOUSING
S4 : 33 SOCIAL HOUSING
AREA 3618 M2



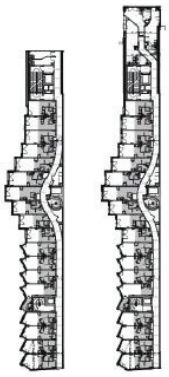
ARCHITECT: HABITER AUTREMENT
S5 : 42 RENTAL HOUSING
AREA 3 279 M2

ARCHITECT: FAA + XDGA
N5 : 44 RENTAL
S6 : 43 RENTAL
AREA: 3 571 M2

ARCHITECT: HONDELATTE LAPORTE
S7 : 82 RENTAL
AREA: 7 355 M2



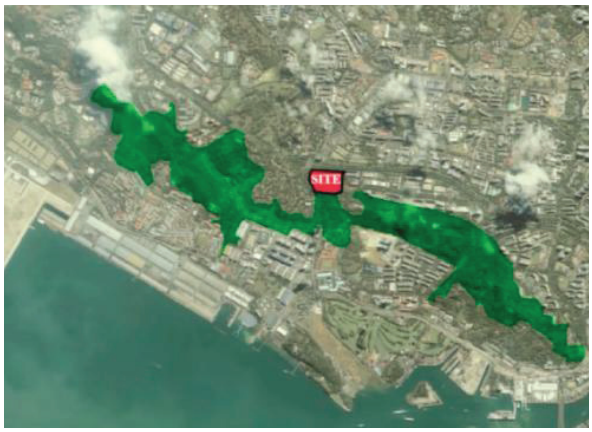
ARCHITECT: L' AUC AS
E1 - 147 STUDENT HOUSING
AREA: 4 170 M2



Case - Study 3

The Interlace

"The compound megastructure"



The Interlace is located next to Telok Blangah Hill Park, a green strip of land which extends out from Mount Faber Park along the green belt of Southern Ridges.
Source: courtesy © OMA/Ole Scheeren

Postcard of Singapore, 1907
Source: courtesy © OMA/Ole Scheeren

Aerial View, ***The Interlace***, 2016
Source: courtesy © OMA/Ole Scheeren

3.

The Interlace

OMA+Ole Scheeren
Singapore, 2007-2013

170,000 m2
PROGRAM: 1,040 Residences 144,000 m2, Clubhouse / Amenities 1,500 m2, Retail 500 m2, Ancillary / MEP 24,000 m2, Basement Parking 2,600 spaces

3.1. Site, context and historical background

Singapore has densified fast during the last century, bearing today an intense accumulation of high-rise buildings stacked aside, popping up from its tropical green soil. During a lecture at the World Architecture Festival 2014 in Singapore, Ole Scheeren - the architect of the project together with OMA[1] - refers to a postcard of Singapore, dating from 1907, exactly one hundred years before the beginning of his work on the project The Interlace with OMA. The postcard [image] showed indeed the very basic nature of Singapore: "*a little fishing village bearing the qualities of a social ecosystem*"[2].

The site of the Interlace - "*an expansive 8 hectare site in the heart of Singapore's Southern Ridges*", between three opulent jungle settings in Singapore - Kent Ridge, Telok Blangah and Mount Faber Park - is located alongside one of the largest green belts of Singapore [image]; thus, it is in close relation with nature – a green belt of parks and leisure with a 9 kilometer extension. The site is surrounded by a superhighway and HP's offices; "*a short drive west from Singapore's central business district*". The site has indeed a privileged position between city/urbanity and nature, as it benefits from connections to a wide diversity of recreational and corporate centres as well as to transportation networks to all other key points of the city.

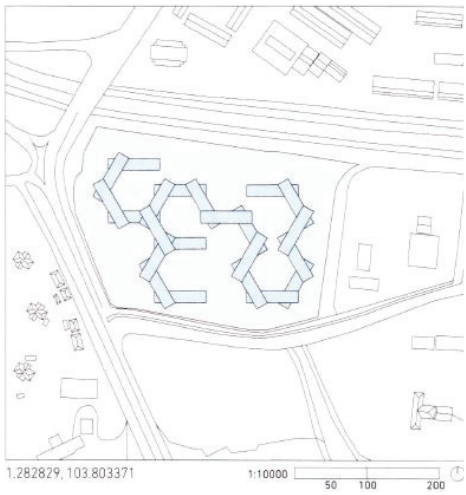
While referring to the current built landscape of Singapore, Ole Scheeren notes that the latest architectural realizations are mostly towers: tall, slender and dense buildings containing a maximum number of apartment units. But he notes that the social relations are very limited within these schemes; on the one hand, there's no relation between the different floors within the building and, on the other hand, the areas 'in between' the towers become residual urban space.

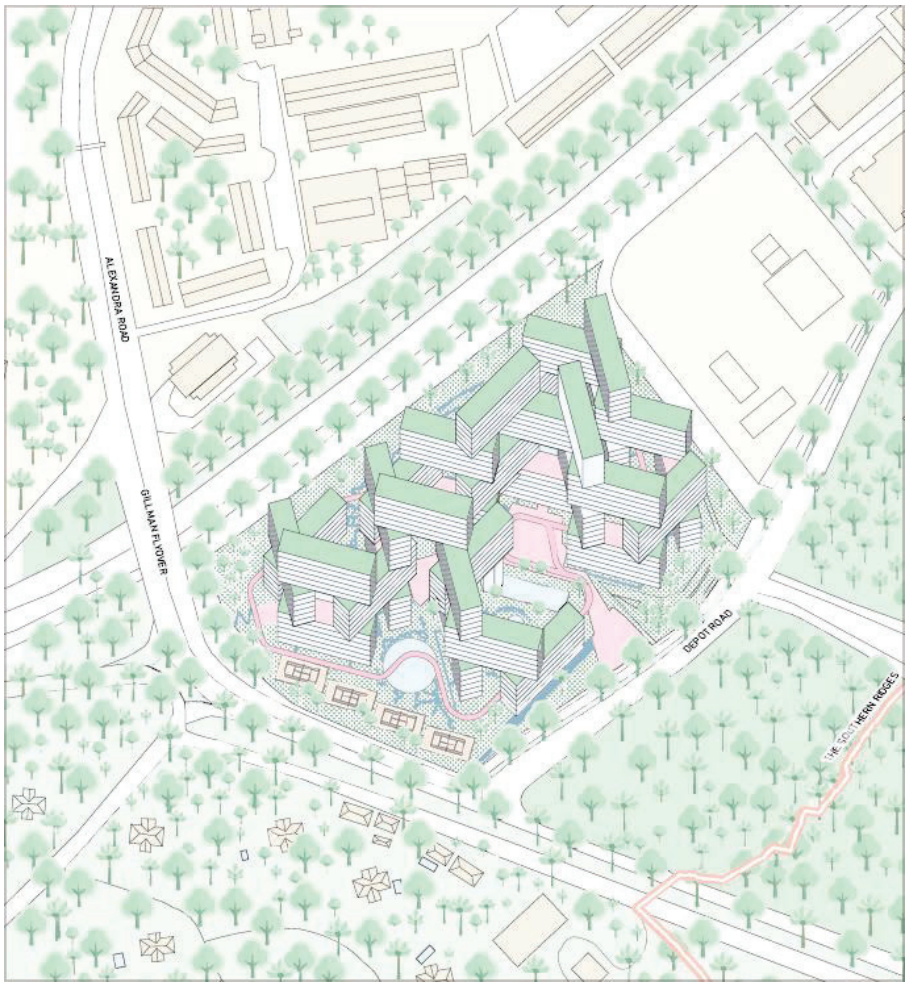
Gillman Heights condominium (demolished)
Source: http://propertyhighlights.blogspot.ch

The former residential development located at the site of the Interlace was the Gillman Heights condominium [image] – composed of a total of 10 blocks (four 20 storey-high towers and six 4 storey-high blocks) – a gated condo corresponding

1 The Interlace was designed by OMA, "*later claimed as a product of Ole Scheeren's independent talents as he sought to establish his own practice, Büro Ole Scheeren, out from the long shadow of the OMA empire*".

2 WAF - World Architecture Festival 2014, "The World of Cities" - Lecture by Ole Scheeren, Singapore, 2014.





Residential 99%
Dwellings: 1'040
Parking Spaces: 2'600
Retail 1%

Source: a+t research group, *Form&Data*, a+t, Vitoria-Gasteiz, 2016

to the typical 'tower type' that is normally applied to housing developments in Singapore. The former development contained 607 dwellings and one commercial unit.

3.2. The Interlace – Process

By the end of 2007, a "*CapitaLand-led consortium - comprising CapitaLand Residential Singapore Pte Ltd, Hotel Properties Limited and a third shareholder - signed the sale and purchase agreement to acquire the site located along Alexandra Road*"[3]. In that same year, OMA/Ole Scheeren have been commissioned to design The Interlace - a new high-density housing scheme that was about to become "*one of the largest and most innovative residential developments in Singapore*"[4], almost doubling the quantity of homes and activities of the former development. With approximately 170,000 m^2 total area, the new complex provides over 1'040 condominium units of multiple different sizes and typologies, interposed with an intense offer of outdoor spaces and landscaping.

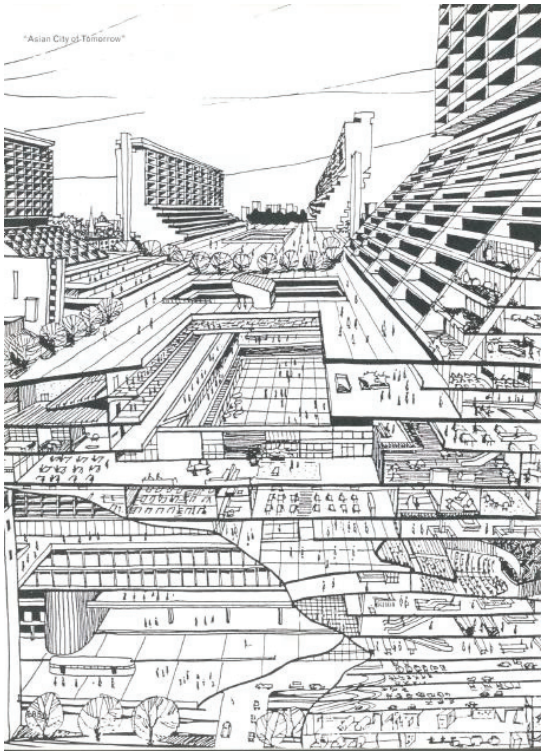
The urban regulations applying to the 8 Ha site of The Interlace imposed a 24-storey height limit and thus, what this project of densification could have looked like, in a normal case scenario, would be another cluster of twelve slender towers with reduced distance in between and the intermediary space at ground level would be nothing but residual. Ole Scheeren explains what motivated him to invert this tendency: "*Cities are increasingly dense, increasingly vertical. Yet, they are no longer determined by a vision for a greater public, but rather individual buildings built mostly by developers. And the difficulty that it generates is that you get a series of towers, mostly towers located one next to the other, each planned individually. But what happens to the 'in between' of those buildings, what has happened to the space of the city*? (…) *I wanted to think how we could change this notion of individual isolated towers and reflect on a structural idea: how could a building complex express not isolation but rather togetherness?*"[5]. Scheeren adds: "*Instead of following the default typology of housing in dense urban environments – clusters of isolated towers – the design turns vertical isolation into horizontal connectivity and reinstates the notion of community as a central issue in today's society.*"[6]

3 CapitaLand News Release, 6 February 2007, Singapore : "*CapitaLand has signed a Sale and Purchase Agreement to acquire the Gillman Heights Condominium, located along Alexandra Road, through a collective sale. CapitaLand will pay S$548 million, which is about S$363 per square foot per plot ratio, inclusive of a differential premium of S$90 million to top up the lease to 99 years and to increase the plot ratio to 2.1. Gillman Heights Condominium sits on a 836,432-square feet, 99-year leasehold, site. There are 607 apartments and one shop unit in the existing development, which comprises a total of 10 blocks, four of which are 20 storeys high and the remaining six blocks are four storeys high. Approval has been obtained from over 80% of the owners to proceed with the collective sale. The transaction, which is subject to the approval of the Strata Title Board, is expected to be completed by end-2007.*"

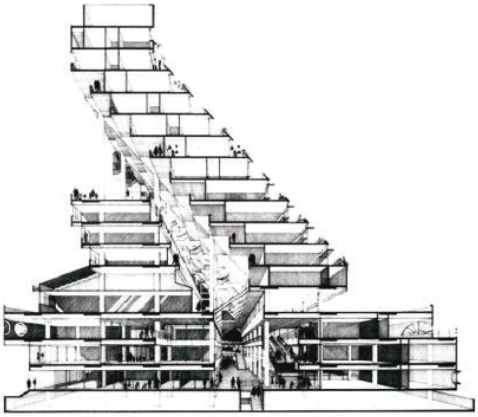
4 CapitaLand News Release, 4 September 2009, Singapore.

5 World Architecture Festival 2014 in Singapore, Ole Scheeren, Singapore.

6 Source: http://buro-os.com/the-interlace/ (15.08.2016)



SPUR, ***Asian City of Tomorrow***, 1967
Source: Rem Koolhaas, Bruce Mau, *S,M,L,XL*, p. 1056.



Woh Hup, ***Golden Mile Complex - Section***, 1973
Source: https://stateofbuildings.sg/places/golden-mile-complex

The architect states that an extensive number of volumetric studies have been developed by the design team prior to reaching a scheme that could succeed at conciliating an interesting articulation of vertical stacking (one couldn't escape from growing vertically while facing the demand for high-density living) with an effective model of community life. During the above-mentioned lecture at the WAF in Singapore, Ole Scheeren referred to the designs of the Japanese Metabolists and also to Cedric Price's "Fun Palace" as fundamental sources of inspiration to his own work with OMA. And it is indeed not difficult, as we look at the Interlace, to find similarities between this scheme and the projects included in Reyner Banham's catalogue of Megastructures[7], namely the ones of Yona Friedman or Constant Nieuwenhuys. Yet the design of the Interlace – a system of equal-size *"blocks stacked in a hexagonal pattern that criss-crosses the site – may also recall the Metabolism experiments of Arata Isozaki, Masato Otaka and Fumihiko Maki"*, amidst many others. Rem Koolhaas's fascination over the Japanese Metabolism is well known and has recently been confirmed through the launch of the book *Project Japan: Metabolism Talks*[8]. An interesting fact is that the Interlace's concept design phase, debuted in 2007, coincided with the beginning of Rem Koolhaas's work on this publication (while, curiously, the beginning of De Rotterdam's design had concurred with the publication of the Bigness manifesto and the launch of *S,M,L,XL*).

Yet, Rem Koolhaas's first approach to Metabolism, and to the specific urban development of Singapore, dates back to 1995. The article "Singapore Songlines" [9], published in the final chapter of *S,M,L,XL*, describes how, from 1965 to 1995, Singapore has turned into a 'Garden City', through strategies that normally required a *tabula rasa* of the pre-existing context. Koolhaas starts by describing the works of the SPUR (Singapore Planning & Urban Research group), in particular a manifesto-document dating from 1967 called "Asian City of Tomorrow" [image], which foresaw "*a city where we have dwellings that stretch upwards towards the sky, and beneath them people humming with activity in the business houses, governmental offices, educational centres, theatres, open spaces and recreational centres. Imagine a city where the various centres of activity are linked up by an efficient rapid transport system,… where people make their living by day where people live by night… This is our Asian City of Tomorrow.*"[10] . Koolhaas notes how "*at first, the sketch seems as a bold pastiche of contemporary megastructural fantasies*"[11], bearing an exacerbation of the ideas of density, congestion, superposition and… connection.

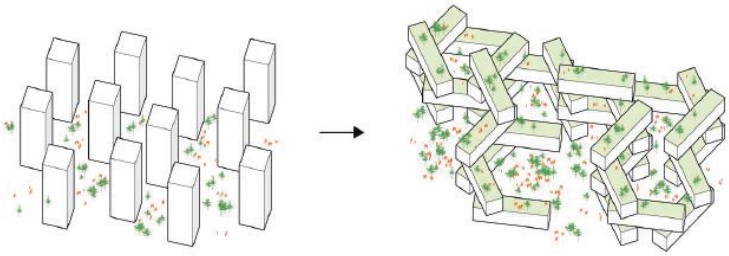
7 Reyner Banham, *Megastructure - Urban Futures of the Recent Past*, Thames and Hudson, London 1976.

8 Rem Koolhaas & Hans-Ulrich Obrist, *Project Japan, Metabolism Talks...*, Taschen GmbH., Köln, 2011.

9 Rem Koolhaas, "Singapore Songlines", *in* Rem Koolhaas, Bruce Mau, *S M L XL*, Monacelli Press, New York, 1997, (pp. 1008-1097).

10 SPUR 65-67 (Singapore Variations of a Theme Park 1967), p. 5., quoted in Rem Koolhaas, Bruce Mau, S,M,L,XL, *op. cit.* p. 1055.

11 *Ibidem*, p. 1055.



«The Interlace breaks away from Singapore's standard typology of isolated, vertical apartment towers and instead explores a dramatically different approach to tropical living: an expansive interconnected network of living and communal spaces integrated with the natural environment.»

Source: courtesy © OMA/Ole Scheeren

The architectural strategy: zig-zag stacked blocks.

This reference may bear compelling arguments towards the depiction of Singapore's development as being nurtured by a larger architectural trend at the time, gathering principles from Corbusian planning ideals to Metabolism movement and its local vanguard, in particular Fumihiko Maki's linkages – as Koolhaas observes "Like Team X, Maki is obsessed with connections"[12] -, ultimately determining the character of Singapore as a "Generic City" for being a unique paradigm of a generic agglomeration of mixed influences.

Two examples from this period are presented in *S,M,L,XL*: the People's Park Complex (1967), by W. Lim, T. K. Soon and K. S. Chuan, and also the Golden Mile Complex (1973), by Woh Hup [image in the previous page], mixed use buildings based on Metabolist ideals. Referring to the second, Koolhaas notices how "*the components are no longer separate and autonomous but absorbed in a single 16-story multi-use complex*"[13] – and also the fact that, for the first time in Singapore, a stepped terrace typology has been built, enabling small sunlit gardens and unobstructed views.

While avoiding the establishment of direct relations between these historical references and the design of the The Interlace (as there is certainly some incongruity on the idea of materializing a megastructure of the 1970s into a luxurious condo), it may be relevant to bear such examples in mind for a full understanding of the principles behind the project, as OMA's professed approach has long been to get inspiration from Modern architecture and some particular avant-garde buildings developed or built in the past to sustain their concepts and produce their specific architectural language. The Interlace seems to be no exception to this principle.

3.3. The Interlace - a complex architectural strategy

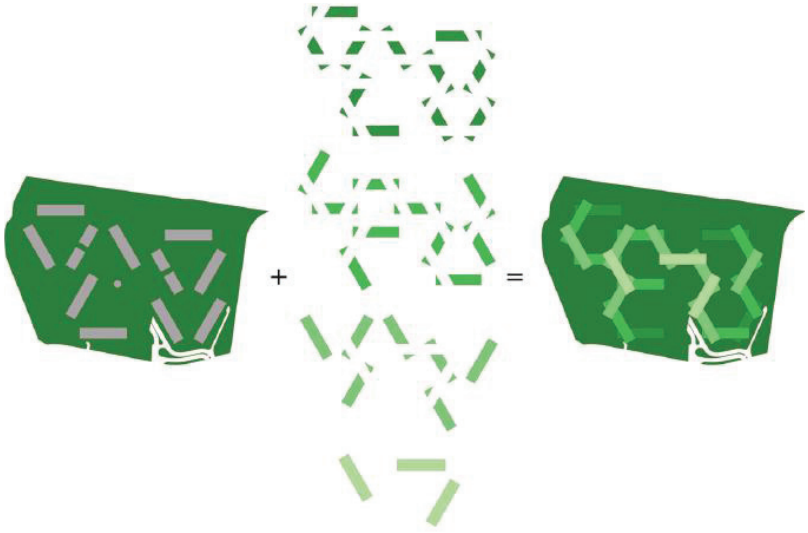
Just as much as the first two case studies, the Interlace bears an ambiguous scale: "*too large to be considered a singular architecture building, and yet not quite sizeable to comprise an area that could be claimed as urban design. The scheme is undoubtedly big: the size of a small village, easily sheltering over three thousand people when fully inhabited*" [14].

Unlike the two first case studies that, as we have seen, endured a series of intricacies related to procedural complexity - justified mostly through the size of the operation and involved stakeholders -, the prevailing complexity of the Interlace seems to reside on the architecture itself, and on the strategies that have been applied to the conception of its intertwined scheme. The design of the Interlace consists of a complex arrangement of private and communal spaces, seeking to invent a reinterpretation of the idea of 'life in community' within a context of high density. A total of 31 apartment blocks, each one containing six floors of housing, are stacked around hexagonal courtyards at the ground level, as an extensive network

12 *Ibid.,* p. 1049.

13 *Ibid.,* p. 1069.

14 With 1040 residential units and 2'600 car-parking spaces, the development sits on 8 Ha with a plot ratio of 2:1, the total gross floor area being 170,000 m^2.



The site is 112% green comparing to not building on the site
Source: Courtesy © OMA/Ole Scheeren

Courtyard identity diagram displaying a multitude of public spaces.
Source: http://ctbuh.org/TallBuildings/

of leisure and dwelling spaces intercalated with the natural environment – three fundamental elements that the project intertwines as a complex three-dimensional system. Patricia Chia, CEO of CapitaLand Residential Singapore summarizes this concept through the project designation: "*The name, The Interlace, reinforces the interconnectivity between man and the space, community and natural environment surrounding him. Ole Scheeren has created a new postcard for Singapore.*" [15]

The Interlace claims to incorporate environmental sustainability resources that have been achieved through meticulous study of the solar exposure, winds and specific conditions related to the site's microclimate. "*Water bodies have been strategically placed within defined wind corridors, which allow evaporative cooling to happen along wind paths, reducing local air temperatures and improving the thermal comfort of outdoor recreation spaces in strategic micro-climate zones*"[16]. Moreover, Scheeren claims that the site is 112% green comparing to not building on the site [image].

The rigid building code of the place and the need for floor ratio efficiency (due mainly to the high costs of the land) has strongly influenced the design of the Interlace: "*in Singapore, the floor area maximization is a priority, whereas the tools and artifices of the trade can make or break a project*" (and undermine the power of the architect), as already observed in the analyses of the first two case-studies. Being a scheme of surface efficiency and code compliance, the Interlace conveys creative intelligence, as noted by the Singapore-based American architect Erik L'Heureux: "*the six-storey block heights can be read as a product of a GFA loophole, where the terraces placed six storeys below (and covered) are not counted in the total GFA sum – five storeys and the loophole does not apply, seven storeys and one is wasting real estate. Likewise, the block length is determined by sticking back-to-back two clusters of four residential units to a single core, maximising one-way travel distance. This slight of hand eliminates the need for two means of egress stairs at each lift lobby, greatly amplifying the floor plate efficiency. Indeed, the majority of the blocks are configured this way. Window balconies, open terraces, planter boxes and perforated slabs are the visible syntax of GFA regulation, forming the basis for the architectural articulation*"[17].

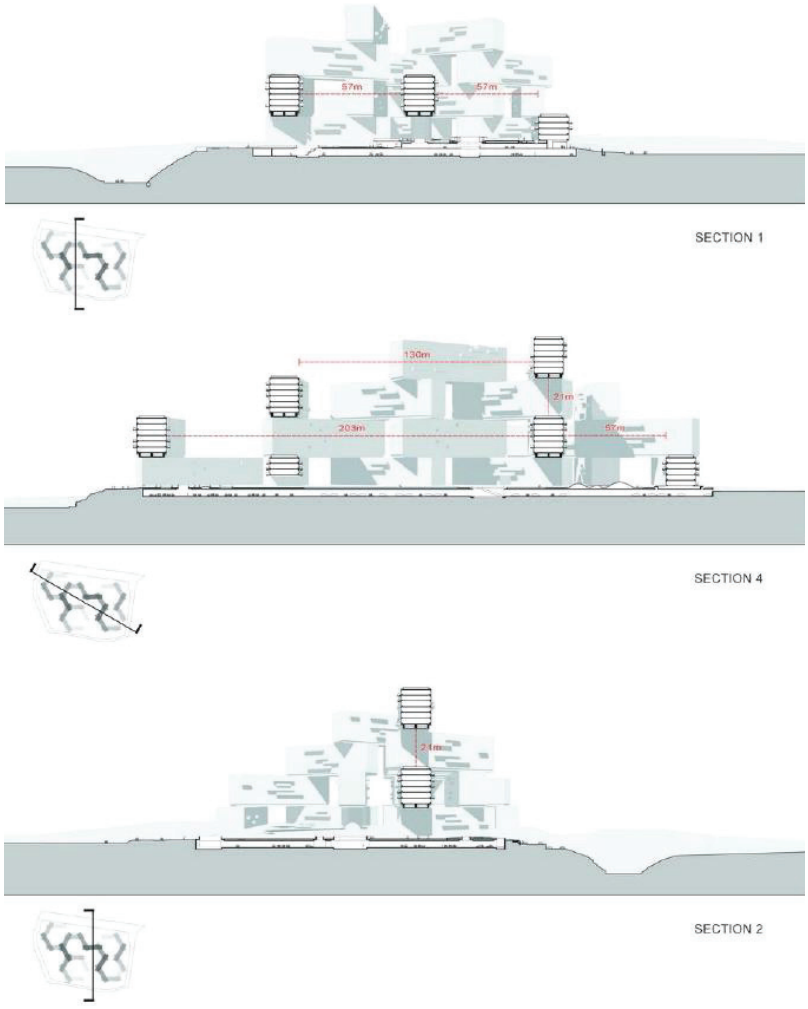
Despite the inescapable obligation to deal with the developer's will and the applicable regulations, the fact that this development is fully fund by private investors[18] may

15 Source: http://www.hotelprop.com.sg/newsroom/News%20Release_%20CapitaLand%20and%20Hotel%20Properties%20Limited%20unveil%20OMA%20design%20for%20The%20Interlace%20condominium%20at%20Gillman%20Heights.pdf (02/08/2016)

16 Full description at http://www.theinterlace.com (15.09.2016).

17 Erik L'Heureux, "The Interlace", *Australian Design Review*, November 2014. Web source: https://www.australiandesignreview.com/architecture/48877-the-interlace (12.07.2016)

18 "*In a press conference at the Singapore Raffles Hotel, Patricia Chia, chief executive officer of CapitaLand Residential Singapore revealed that the total investment for the project is estimated at S$1.4 billion which includes the price of the land at $548 million and construction costs (about $250-$270 per square feet). Also, the credit margin spread for the project is 3.48% and is financed by 7 banks for 5 years at $660 million with $1 billion on demand. Chia also said that the prices for the apartments will be comparable to other high-end properties in Singapore. (…)Gillman Heights, given its excellent location near good schools, tertiary and research institutions, will enable us to provide well-designed homes to cater to professionals and their families. We have deliberately expanded our landbank in this sector to cater to*



Distances between the apartment blocks.
Source: Courtesy © OMA/Ole Scheeren & Architectural Review

explain the reason why it enjoyed a bigger design freedom than the previous two case studies. The exceptional features that we see here are indeed quite different from the communal space treatment that we have seen in the previous case studies. The architecture itself seems to be more bold and consistent, and to epitomize a true innovation in the idea of inhabiting the Big Building. Another reason for this design freedom might relate to the Asian context, as confirmed by Ole Scheeren: "*Asia clearly has a series of attributes that differ from Europe. The two most obvious ones would be scale and speed, but I think there is also an even more fundamental one – a certain fearlessness and vision for the future. It is a dedication to what the future may be like without the fear of losing something*"[19].

3.4. The (lack of) functional mix

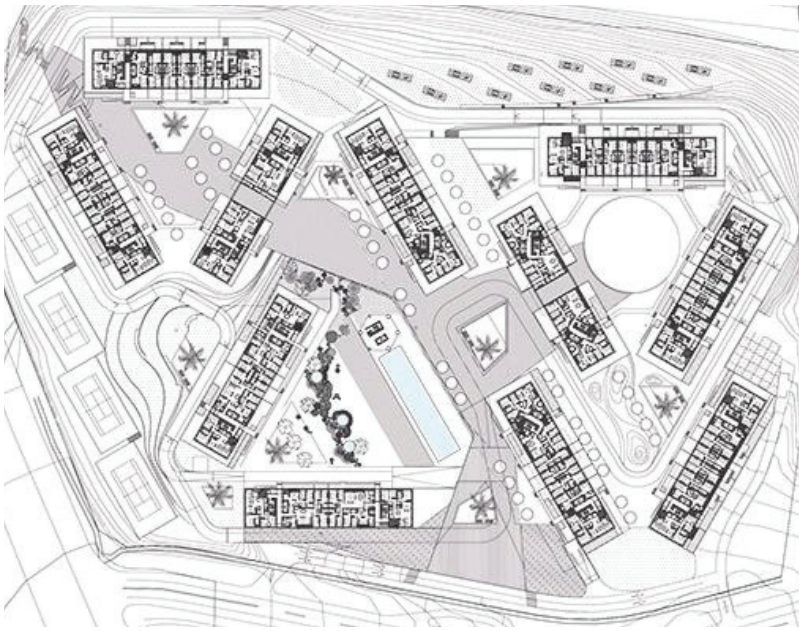
Although the design of the Interlace bears an iconic, intense and original configuration, its vigour at an urban level seems to remain far under the expectations and, in some aspects, to lack consistency with the theoretical principles proclaimed by Rem Koolhaas. It is indeed at an urban scale that the main fragility of the object becomes more evident.

As seen in the previous chapters, since the 1970s, Rem Koolhaas has consistently advocated programmatic diversity and urban congestion as fundamental instruments at the service of an urban resurgence of the contemporary city. Indeed, the functional mix and the vertical stratification of varied programs have been prescribed as a remedy for the reinvigoration of the urban and architectural contexts – the so-called 'culture of congestion'. This principle is not only described in Delirious New York - it is also latent in projects like Parc de la Villette or the Seattle Public Library. However, and despite the large dimensions of the Interlace, we're left with only eight scanty commercial spaces located at the base of the building, about 75 m2 each, and these are expected to serve the daily needs of a neighbourhood of nearly 3'000 people.

It is possible that this issue has remained out of the reach of the architects' control, and that the reason behind the deficient functional mix and concentration could be seen as the developer's will, or determined by specific zoning directives in Singapore, or it could even be driven by economic and speculative forces that allegedly aim mostly at condos rather than any other urban housing type. Nonetheless, if there is one architectural practice today bearing the power to push for a more thrilling and consistent metropolitan condition, providing programmatic diversity, social interaction, liveliness and neighbourhood publicness, that practice would for sure be OMA. Indeed, OMA's intellectual legacy uses such principles as calling card and therefore each new project from the office is expected to explore thrilling urban statements.

the housing needs of this group of high-mid homebuyers."
Source: http://www.property-report.com/singapore-real-estate-capitaland-and-hpl-unveil-the-interlace/ (02/08/2016)

19 http://www.dezeen.com/2014/10/06/ole-scheeren-interview-world-architecture-festival-2014/



TYPICAL BLOCK PLAN

0 16 FT.
5 M.

13 3 BEDROOM UNIT

14 2 BEDROOM UNIT

15 PENTHOUSE

Source: Courtesy © OMA/Ole Scheeren & Architectural Review

The Interlace, however, neither explores programmatic variety, nor triggers the expected public intensity of an enviable urban environment. Erik L'Heureux reacts against the monofunctional character of the complex, stating that Koolhaas could have had the decisional power to subvert the project brief towards the inclusion of other programs in the scheme and avoid the condo nature of the building: "*Architectural projects at this scale should be public not gated, programmatically diverse, not singular and, ideally, driven by multiple architects and multiple developers. Yes OMA/Büro Ole Scheeren's design is an intelligent and powerful diagram of regulation and large-scale financial capital (one might even say a voluntary prisoner of architectural regulation itself however novel it may appear), but architecture and urban design must be judged by a higher standard, a standard that celebrates and establishes a desire to want to live in a spatially and programmatically diverse tropical city – a tropical metropolis – not just swim in another gated condominium fun pool.*"[20]

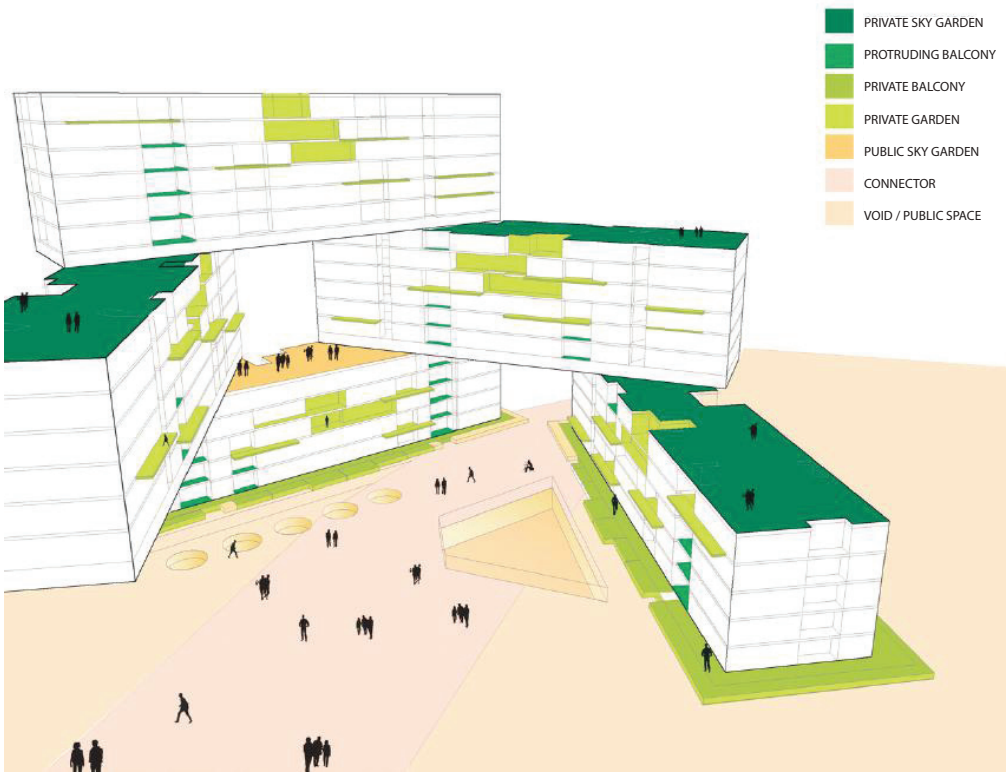
The tough criticism of Erik L'Heureux sounds indeed quite just[21]. Yet the fact becomes even more regretful as we realize that one could easily have envisioned this exact same architectural scheme to function as an articulated network of varied programs, each occupying a piece of this 'leggo amalgamate' without bearing negative interferences on the ensemble – on contrary, different uses would have contributed to the animation and thrill of the ensemble and to the day-and-night liveliness of the building, which would become significantly more thrilling at an urban level. It is indeed regretful that a scheme with such immense potential for the exploration of new urban logics is transformed into an environment for a gated community, regardless of the quality of the living concept and the overall planning of housing.

3.5. Communal spaces

Despite the monofunctional character of the building and the regretful fact that the green space and communal areas at the Interlace are not accessible to the public, it is important to highlight the wide diversity of the ensemble, preconized by the detailed treatment of each communal space. The diversity of the atmospheres and facilities seems to be effective at encouraging social interaction and contributes to the overall sense of community life: "*The rest and leisure areas, as well as the interior*

20 Erik L'Heureux, "The Interlace", *op. cit.*

21 While criticizing the lack of programmatic diversity of the building, Erik L'Heureux refers to some specific New York buildings to highlight what he considers to be the fundamental weak point of the Interlace: "*For comparison, Koolhaas' favourite muse, New York City, in eight Upper East Side residential blocks at 72nd Street, 5th Avenue and Central Park – with the same area of the Interlace – illustrate a deeply urban configuration. Replete with shopping, schools, supermarkets, doctor offices, art galleries and more, fuelled by a bounty of residential units that far exceed the quantity of the Interlace. In Brooklyn, for a softer comparison, in the sleepy Carroll Gardens neighbourhood, there are about 1000 units in townhouses four to five storeys in height spread out over eight blocks. Two churches, a variety of restaurants, retail shops, green areas, streets and backyards produce a residential neighbourhood full of vitality, life and identity. There are only a few small backyard pools, but here life, as celebrated by Jane Jacobs, occurs on the public street and not in the private compound.*" In Erik L'Heureux, "The Interlace", *Australian Design Review*, November 2014, *op. cit.*



Map of common spaces
Source: Courtesy © OMA/Ole Scheeren

Upper level common and private spaces at the Interlace.
Source: Courtesy © OMA/Ole Scheeren

paths, all pedestrian, are designed to build both relationships between residents and a real community. The amenities are also for internal use"[22]. In an interview to Dezeen, Eric Chang, project manager at Büro Ole Scheeren describes the importance of the communal courtyards at The Interlace on the validation of the concept of "vertical village": "*One of our interests in the beginning was to look at how to approach something with such a high density more on the scale of a vertical village than a single building or tower typology. (…) Each courtyard has a different character, and the orienting device for the residents is not the blocks that they live in, but actually the character of the courtyards. So they navigate and locate where they're living by the treatment of the courtyard.*"[23]

Floating above one another, the volumes of the Interlace generate in between communal areas - elevated roof terraces and sky gardens - offering multiple views to the city, the nearby parks and the sea. Through a gradient of spaces with different privacy levels, "*the design generates a multiplicity of qualities and choices for its inhabitants and gives a sense of multi-layered richness and freedom of possibilities for living*"[24]. The complex becomes an intricate articulation of stacked blocks, cascading terraces, balconies and sky gardens – with a gradient of shared and private exterior spaces. At the same time, the superposition of the apartment blocks allows for a proliferation of horizontal plans that is said to be substantially more efficient than the tower typology, and even to offer more green surface than the overall innitial area of the unbuilt site.

Between the stacked blocks, at the ground level of the building, eight generous courtyards – "*each courtyard spanning a distance of 60m and expanding further through the interconnections*" - offer the typical condominium facilities: "*the 50m lap pool, tennis courts, fitness centre, gymnasium, garden zone, spa areas, children's playgrounds, walking track and barbeque areas. The tropical elements are concentrated at the ground plane: lush planting, green walls and water features*".

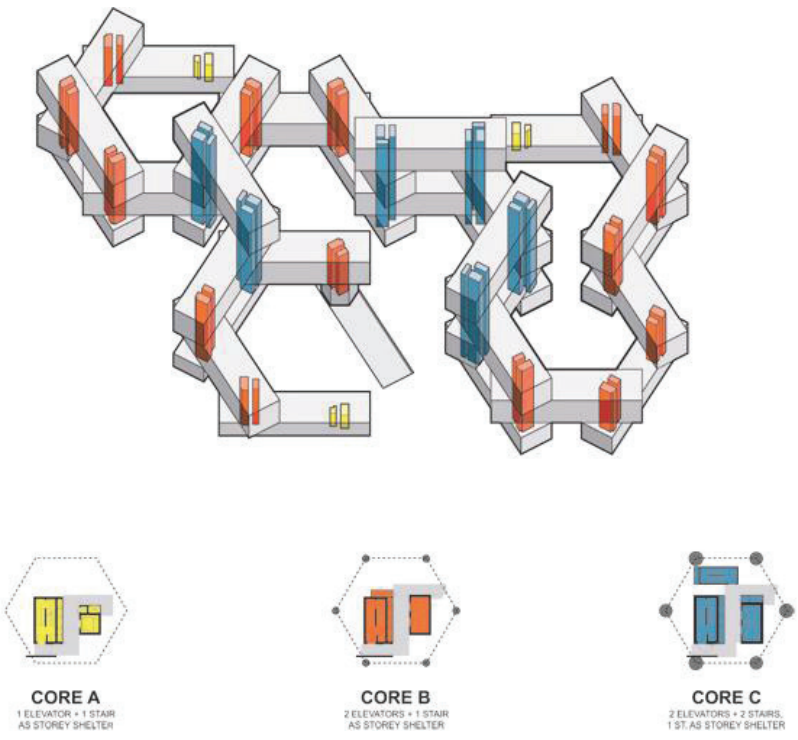
Unlike what has been observed in the first two models, where an inhabitant standing at his/her apartment and looking outside would have no perception of the complexity or thrill of living in a self-contained city, the architectural scheme of the Interlace seems to succeed at keeping that idea of community living constantly present while, interestingly, ensuring the visual comfort and distances between the apartments inside the stacked blocks. Indeed, the most successful trick that OMA/Ole Scheeren seem to have implemented in this scheme is said to be the overturn of the regular tower design of a fast growing Singapore - as per Zaha Hadid's d'Leedon tower complex built nearby the Interlace (developed also by CapitaLand)[25] – to prioritize the horizontal orientation of the vertically stacked of volumes (that ultimately become as tall as the 24 floor towers), creating a single, large interconnected megastructure of the XXI century. The Interlace is

22 Aurora Fernández Per, Javier Mozas, *Form & Data*, a+t, Vitoria-Gasteiz, 2016, p. 276.

23 Source: https://www.youtube.com/watch?v=UogcoxFO884 (12.07.2016)

24 Source: http://buro-os.com/the-interlace/ (12.07.2016)

25 Laura Raskin, "The Interlace", *Architectural Record*, March 2014.



Map of vertical cores
Source: Courtesy © OMA/Ole Scheeren

said to cope with the speedy growth of Singapore as much as the labyrinthine space portrayed by Piranesi used to assist the ambitious growth of the city: "*Piranesi, it must be noted, was describing imaginary prisons in his Le Carceri d'Invenzione, while at the Interlace an expanding middle class comprised of 'well-heeled locals and expats' with discerning taste enjoy a composed tropical lifestyle, where 'community', 'space' and 'nature' are the celebrated trappings of having 'made it'. In an ironic twist of fate, the ambitious Metabolist design is de-radicalised and made into another real estate proposition of programmatic singularity*"[26]. The residents can indeed claim to inhabit a gated well-secured condominium, as 'voluntary prisoners'[27] - somewhat matching the designation of Koolhaas's seminal project - of this particular megastructural building.

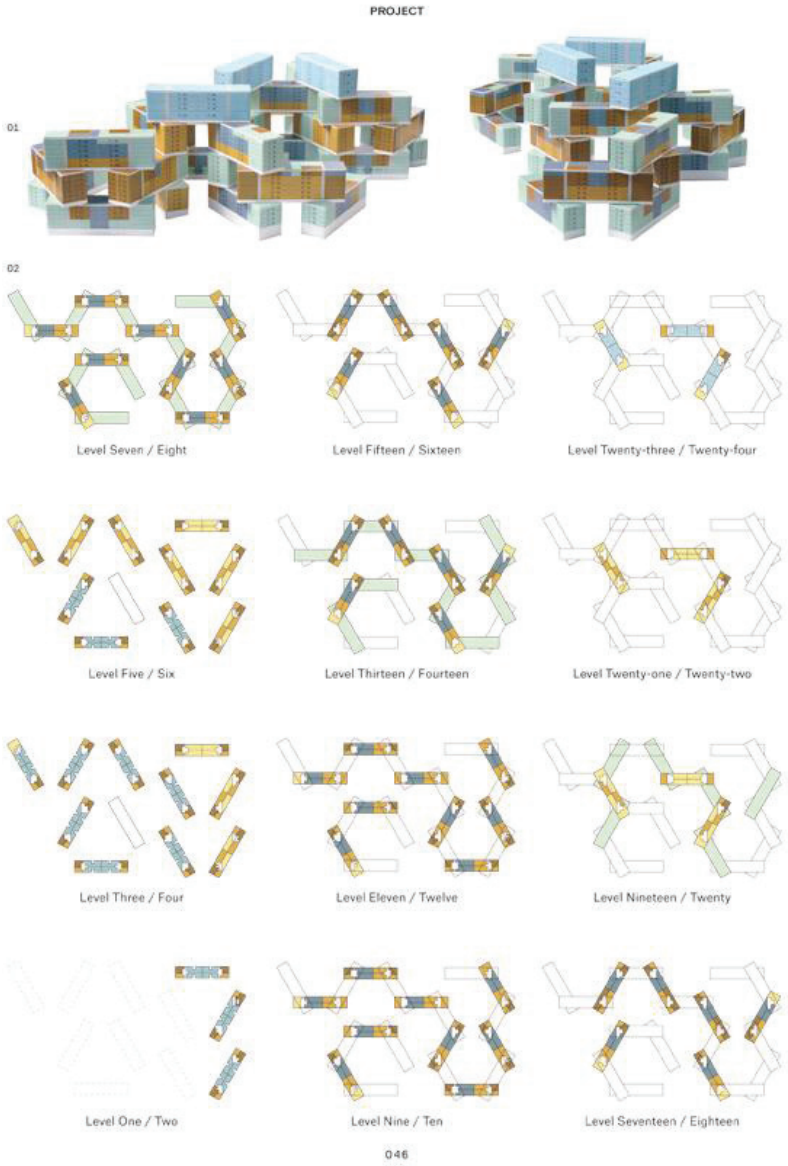
3.6. The circulation logics

The hierarchical design strategy applies not only to the character of the exterior spaces, but also to the paths that guide the inhabitants to their homes. The primary pedestrian path, at the ground level, guides the inhabitants from the entry point to their homes with the succession of courtyards working as fundamental orientation references, enhancing the idea that one lives around a specific courtyard, rather than inside an 'object'. The number of residents living in the blocks that surround each central courtyard determines the pedestrian circulation. Then a secondary system of pedestrian paths guides the inhabitants from the main connector to the vertical cores, and finally to the private front doors of their own apartments. The efficiency of the compact core system - the minimal circulation and maximized floor areas – is said to have partially enabled the complex's *"reasonably priced private housing"* (having as reference the speculative scenario of Singapore's residential market).

Horizontally connected volumes are generally said to establish "*a better-connected and less isolated residential environment*" and indeed, as one observes the scheme of the Interlace, the suggestion of an interconnected system of vertical and horizontal circulation logics raises almost instantly. However, as we analyse the project more in detail, such idea seems to fade, as we understand that the horizontal circulation is restrained only to the base of the blocks, being that the access to the dwellings is made through simple vertical cores that stop at each level. Given the impressive variety of housing blocks and apartment typologies that can be found at the Interlace, it would be interesting to question why an interior gallery system hasn't been planed, in at least a few blocks, allowing access to potential shared terraces on both edges. If this Corbusian horizontal circulation logic were to be applied to this building, the overall circulation scheme would have changed deeply, towards the embodiment of a truly wealthy three-dimensional, complex system of circulations.
It is nonetheless interesting to state that it is sufficient to remain at the ground level of the building to notice the wealth and complexity of the multiple building's

26 Erik L'Heureux, "The Interlace", *op. cit.*

27 Read more about Rem Koolhaas's Project 1972 Architectural Association thesis (together with Madelon Vreisendorp, Elia Zenghelis, and Zoe Zenghelis) "Exodus, or the Voluntary Prisoners of Architecture", in Elia Zenghelis (ed.), *Perfect Acts Of Architecture*, The Museum of Modern Art, New York, 2002.



Floor plans
Source: Courtesy © OMA/Ole Scheeren

The Interlace - Ground level paths and Parking
Source: Courtesy © CapitaLand Development

atmospheres: the small gardens of the terraced houses can be perceived without disrupting privacy, slight differences in level between the different ground floor activities reinforce this concept, as much as the passageways under the volumes at the ground reinforce the thrill of walking through the mega-scale of the building.

parking

As one walks through the courtyards, wide open-air circular openings enable the observation of the parking below the public ground, while above-ground vehicular circulation is minimized to fully liberate the large green areas. Since the site is elevated from the road (for the sake of visual and acoustic comfort), the parking area is not underground but rather semi-sunken, and the open-air voids in the plinth [image], allow for an efficient natural ventilation and natural lighting in the parking floor for 2'600 cars. Due to the building's location near the expressway, the most likely way for the residents to reach the Interlace is by car. The garden-house apartments at the ground level even have a door connecting directly to the parking area (past a 'practical' zone for laundry area and storage), which, as an experience, ends up being rather similar to the one of living in a suburban villa and parking in front of the home door [see plans in the next pages].

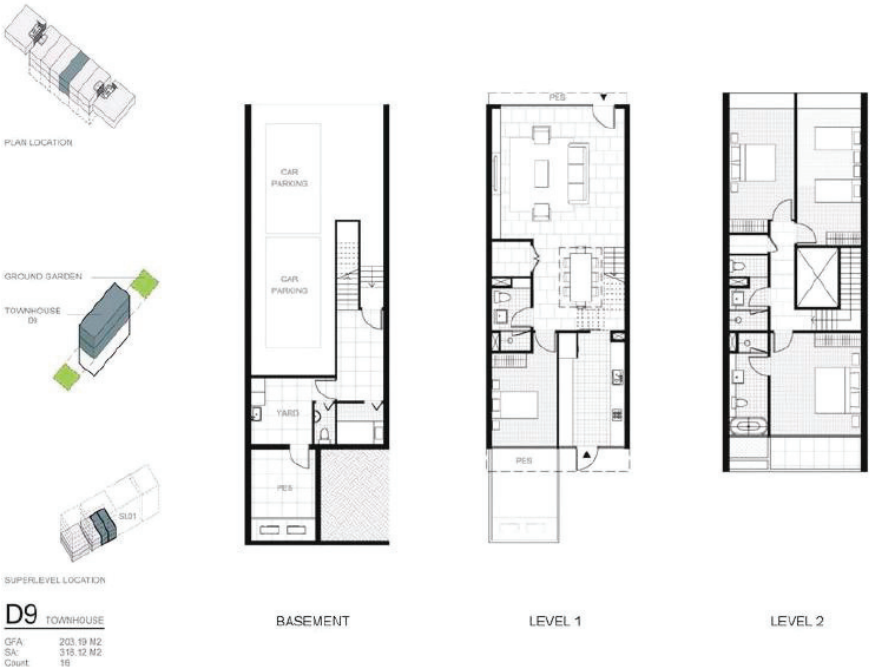
building structure

The structure of the Interlace is rather impressive, mostly because of the expression of the cylindrical structural mega-columns around the cores that sustain the thick slabs, cantilevering 30m in between cores and 10m outwards, on each side (and serving as shelter to the communal spaces below). The columns, concentrated mostly on the façade and on the cores, seem to allow for a possible adaptation and transformation of the building, as much as its fully glazed, regular and generic façades seem to be easily adaptable to any other use in the future. As the distances between blocks are rather comfortable, one could easily imagine a close coexistence of different users without major conflicts.

3.7. Housing

access points

In the points where the stacked blocks coincide vertically, the access cores are integrated with three variants that serve 24, 18 or 6 floors. Each core allows access to 3 or 4 dwellings per floor, avoiding long corridors and allowing for an efficiency of the plan surface. Around each core there are structural cylindrical mega-columns. Their hexagonal shape enables the 3-way turning of the blocks and an efficient orientation for the ensemble of the complex.



Source: Courtesy © CapitaLand Development

typological variety

The first point to be highlighted in regards to the housing scheme is undoubtedly the typological diversity that can be found within the building: the dwellings range in size from 1bedroom to 5 bedroom apartments and in typology, with schemes that go from mono-oriented apartment units, to through apartment (with endless variations), duplex apartments, terraced houses, penthouses.

sunlight

The building blocks layout strategy allows for the majority of the dwelling units to enjoy optimized solar exposure and also for an efficient shadowing of the exterior terraces, maintaining levels of comfort in outdoor spaces and their continuous use throughout the year.

views and setbacks

The ample 60m distance that separates each stacked block proves to be a solid and comfortable distance as it ensures privacy and visual comfort to the inhabitants, as much as stunning views over the tropical jungle beyond and the city in higher points. Moreover, there's a constant visual perception of the ensemble of the dwellings, the exterior prolongations, the communal areas at the base and the elevated common terraces.

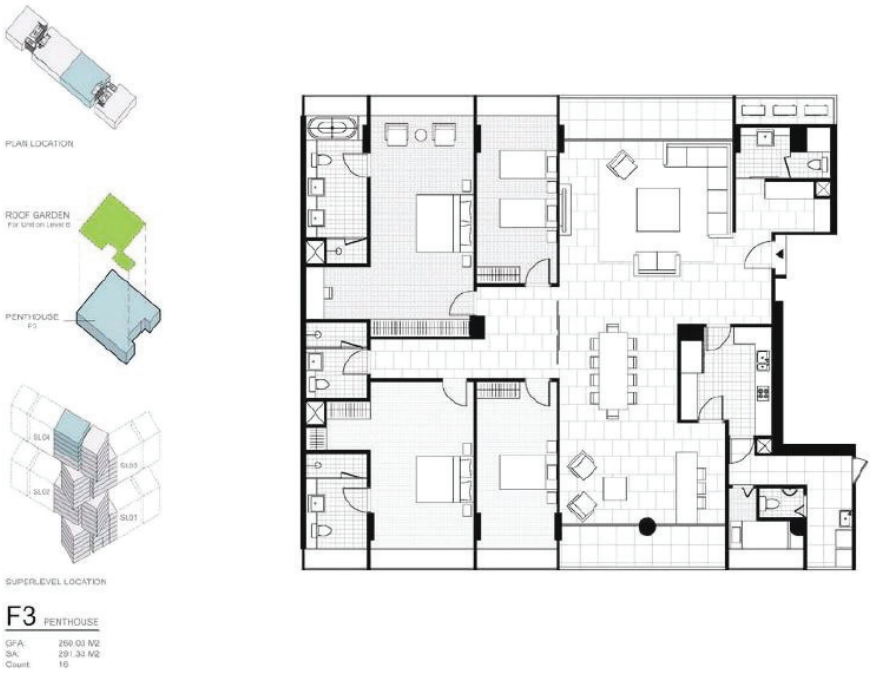
exterior prolongations – balconies, suspended gardens and terraces

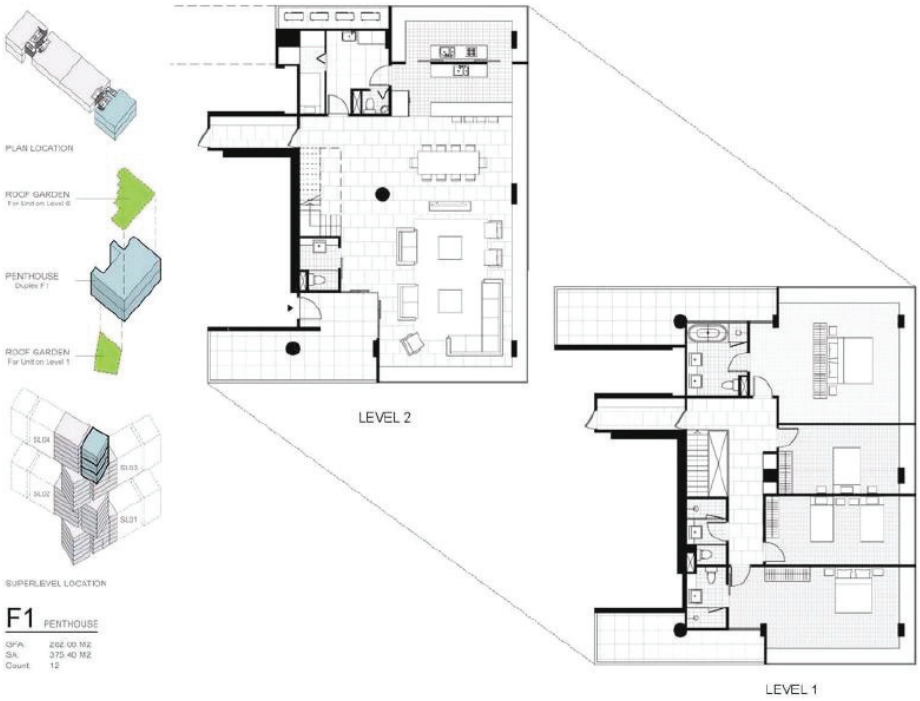
The vegetation is not only an element that is added to the project, but rather an intrinsic aspect to the project. This network of vegetation that punctuates the project lies on the balconies, on the prominent green terraces and on the cliff facades that connect the multiple green, individual or shared terraces that spread among the multiple volumes of the composition.

the apartments - interior atmospheres

In this building, it is particularly important to highlight the detail and care that can be identified in the plan of each individual apartment. The large majority of the apartments are through apartments, which ensures an immediate comfort in terms of sunlight and views. But the care on the treatment of each dwelling applies also to the transitions between the core area, to the entrance hall, the living room and the most private area of the bedrooms. Almost all the apartments ensure the comfort on these transitions. Moreover the proportions of the different spaces are balanced and the areas are comfortable – not too small, not too large. A large number of slight variations that include curved walls, smooth transitions and articulations with exterior prolongations must also be highlighted (see plans).

The fragilities that have been highlighted in the previous case studies regarding the planning of housing are somehow dissipated in this scheme. Despite its lack of programmatic diversity, this building may somehow serve as potential evidence that it is indeed possible to implement innovation, quality, complexity and typological

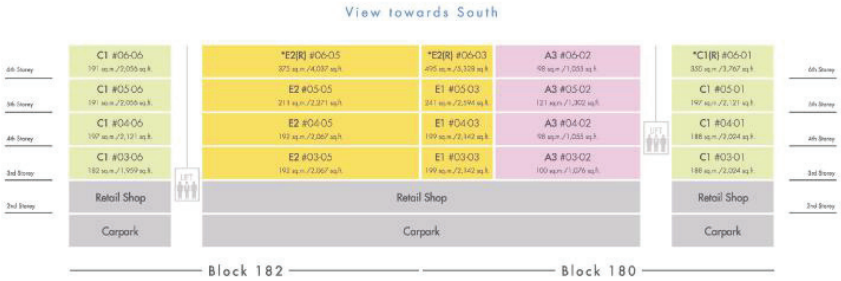


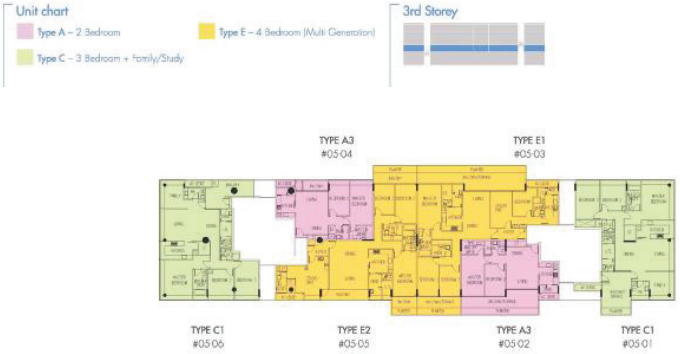


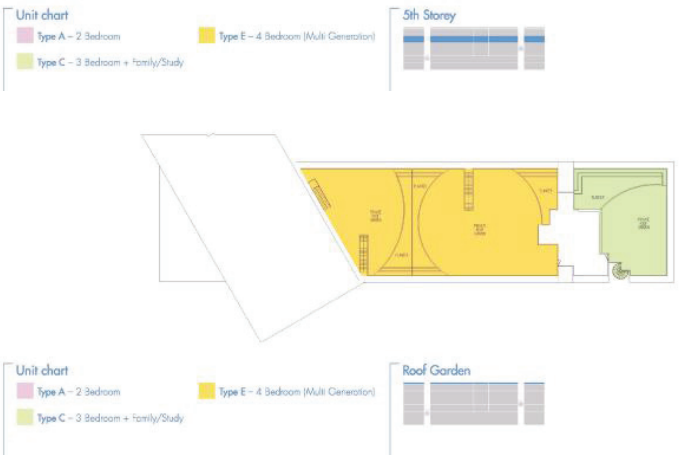
Source: Courtesy © CapitaLand Development

diversity in the design of housing models for the Big Building. Moreover, we believe that such scheme could function equally well if some of the blocks were to hold different uses such as offices or equipments – it would only be a matter of increasing the core size and ensuring the security of the different zones. Indeed, the particular configuration of this building seems to ensure comfortable setbacks and there are very little identifiable situations that could be at the origin of privacy issues, which means that housing could function aside other uses without significant visual conflicts.

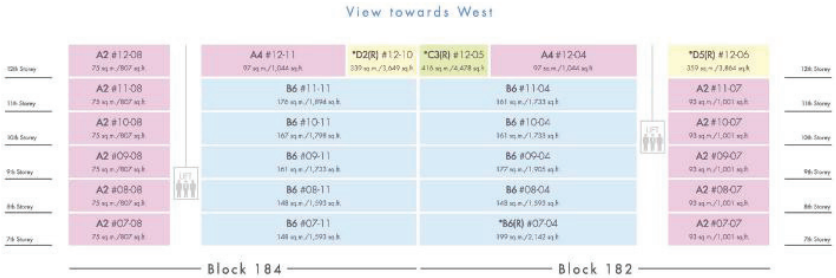
It is also interesting to state how the scheme departs from an abstract, enormous and brutalistic diagram - recalling the often utopian schemes of the 1970s megastructures - and yet succeeds at filling its interior with a detailed, cherished and articulated humane scale that triggers a complex and vibrant living environment.

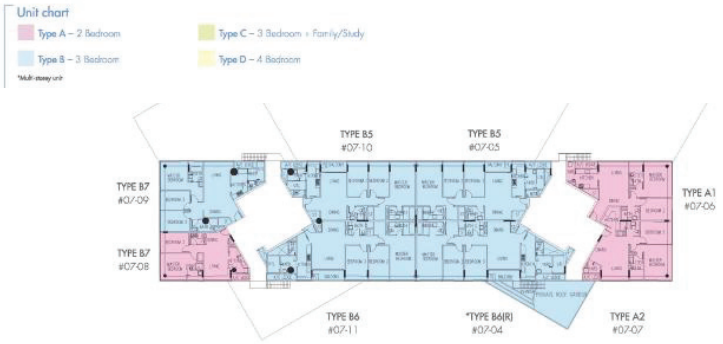


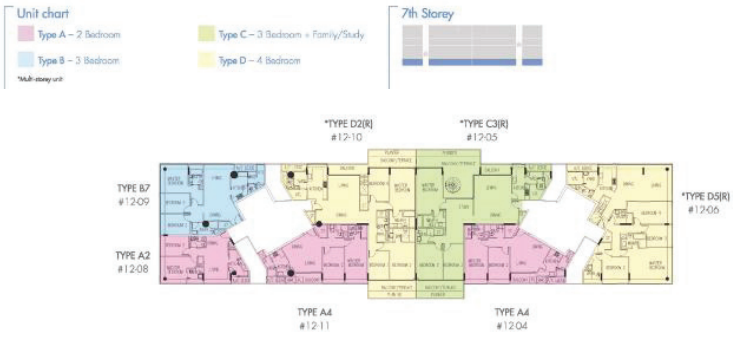


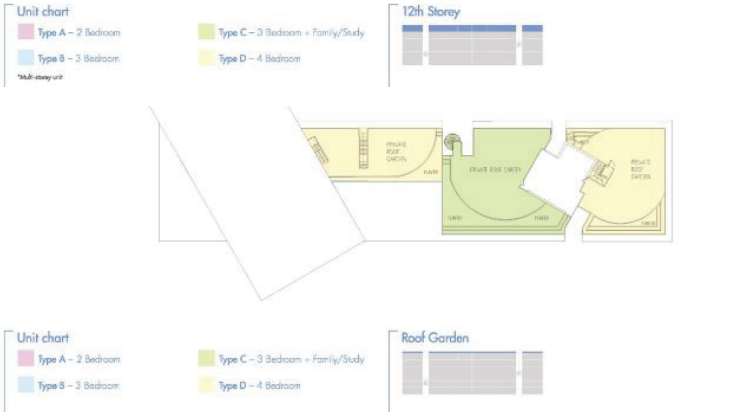


The Interlace - Floor Plans
Source: Courtesy © CapitaLand Development

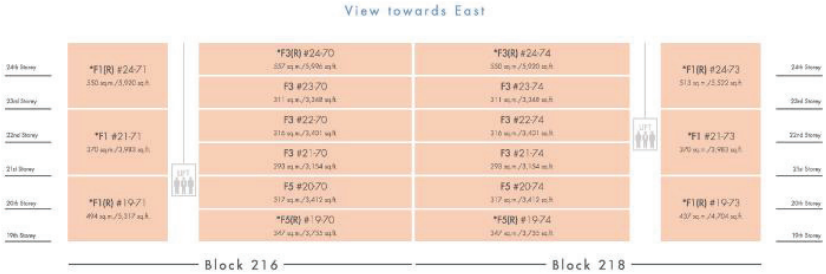


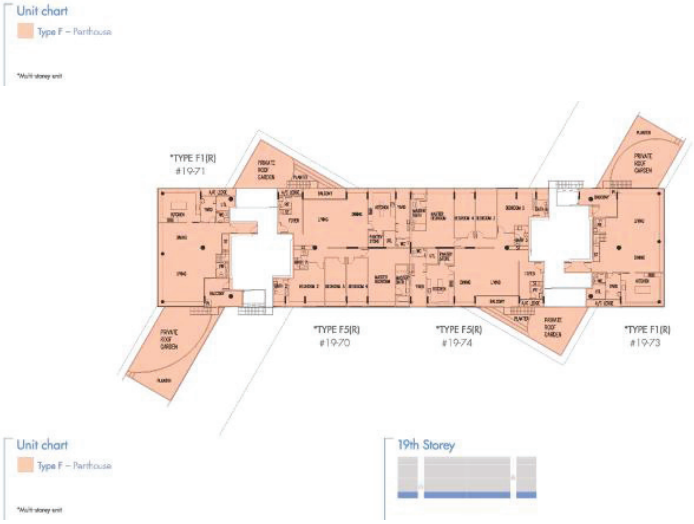






The Interlace - Floor Plans
Source: Courtesy © CapitaLand Development





The Interlace - Floor Plans
Source: Courtesy © CapitaLand Development

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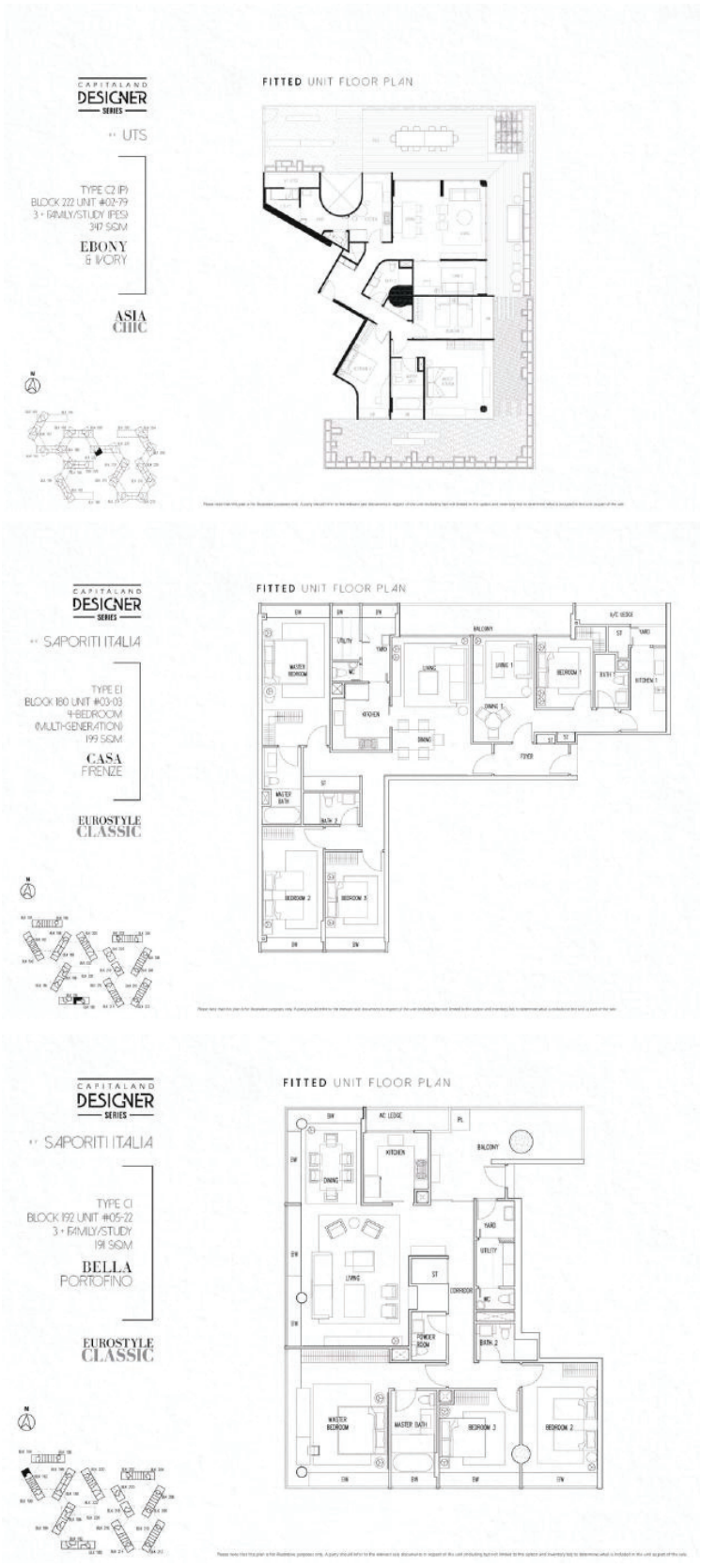
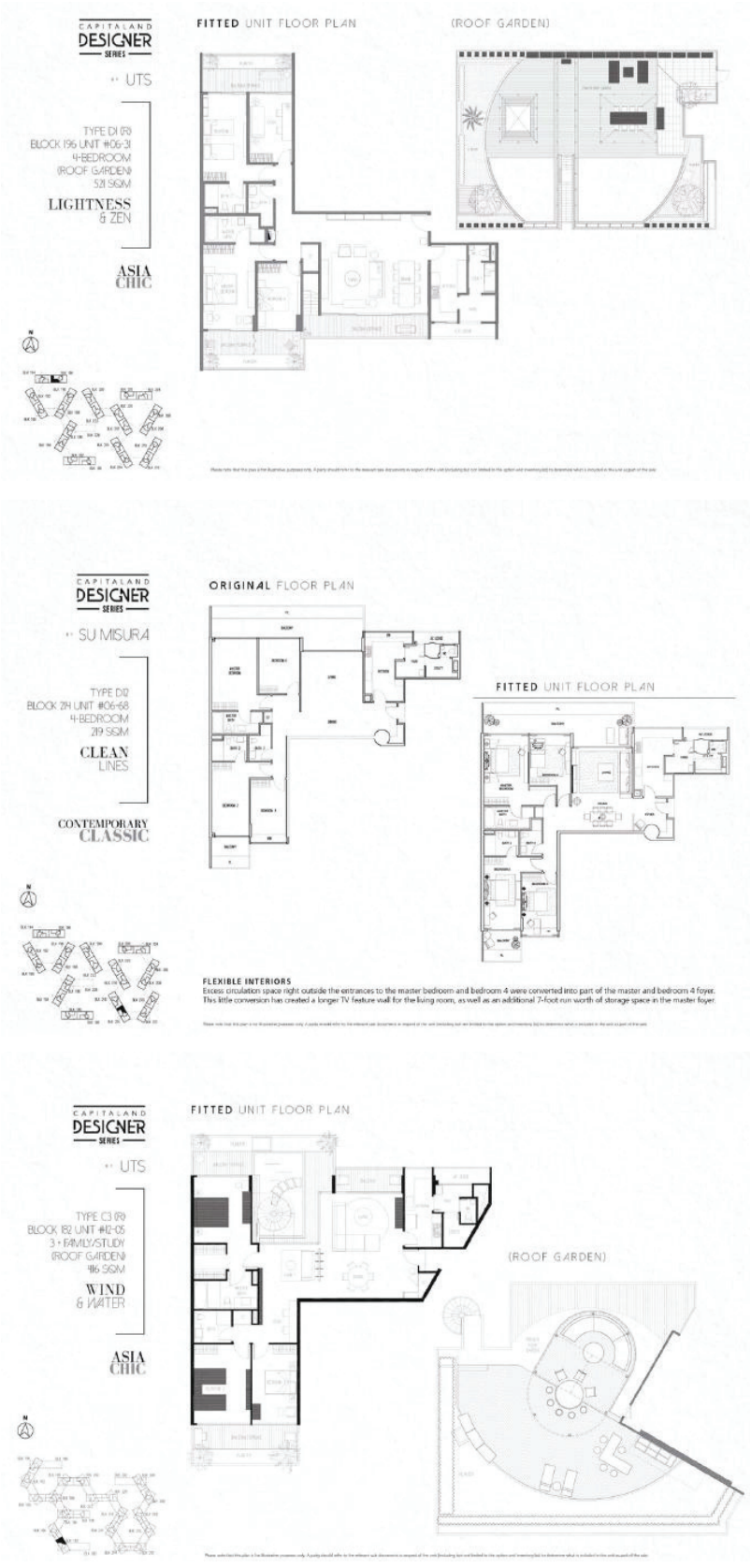
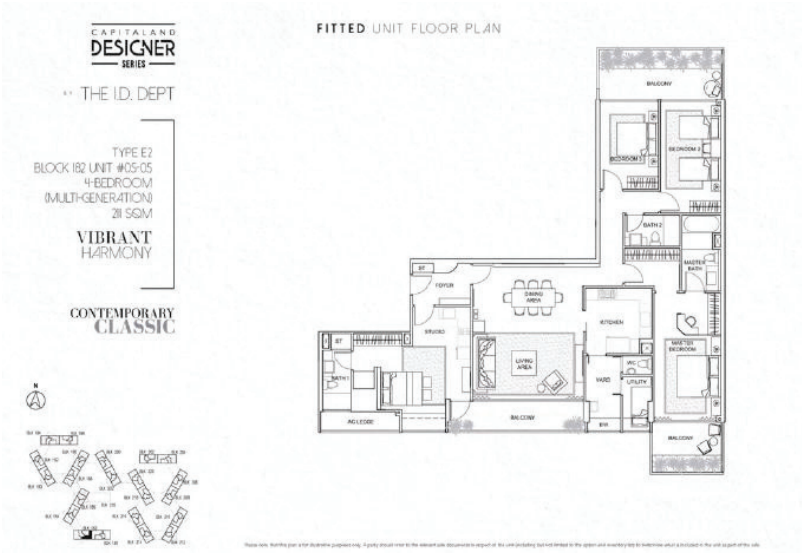
Source: Courtesy © CapitaLand Development

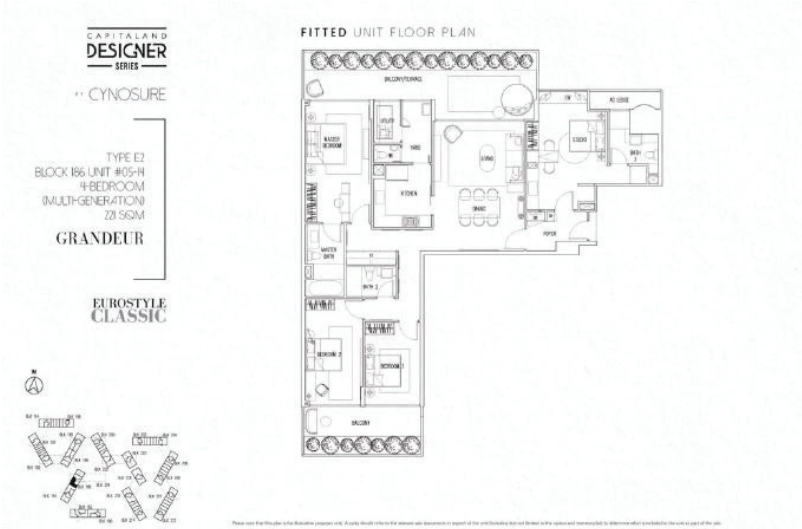


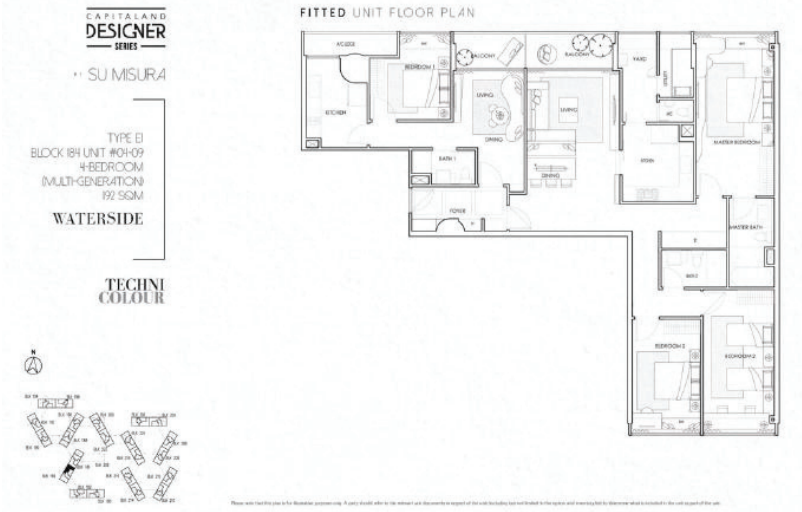
The Interlace - Apartment Plans
Source: Courtesy © CapitaLand Development



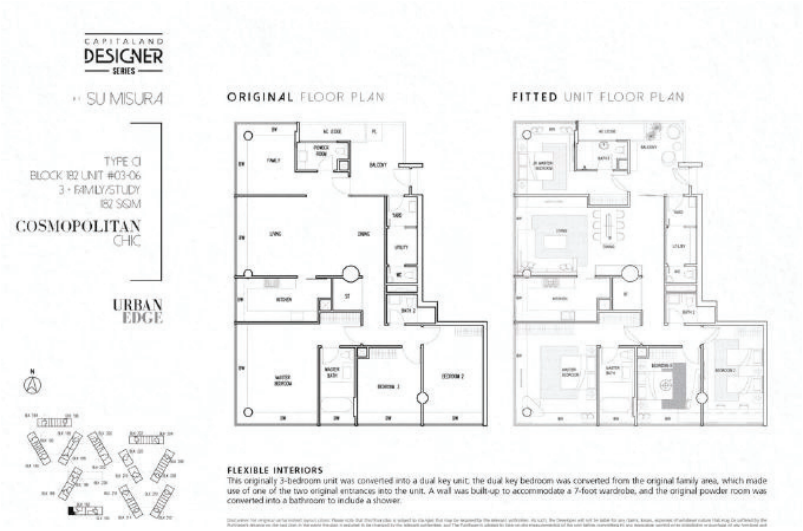
The Interlace - Apartment Plans
Source: Courtesy © CapitaLand Development

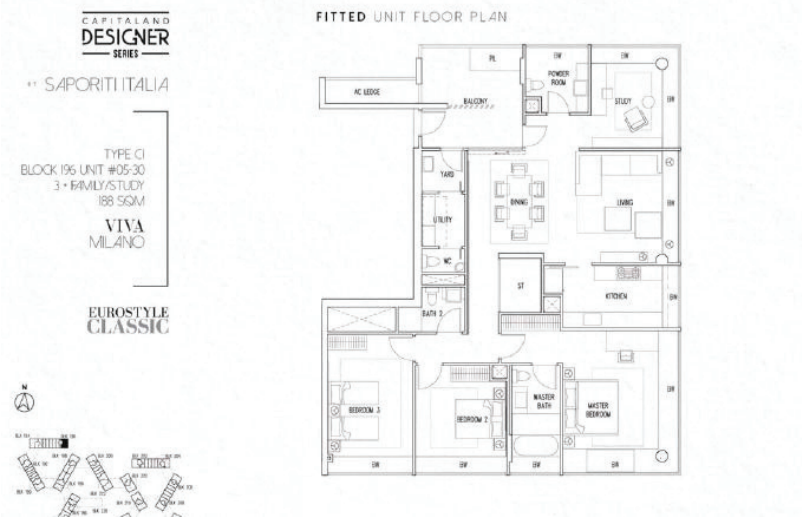






The Interlace - Apartment Plans
Source: Courtesy © CapitaLand Development





The Interlace - Apartment Plans
Source: Courtesy © CapitaLand Development

05
Design Strategies

Design Strategies

General approach

In the next pages, we will explore a series of design strategies and hypotheses that will take as base the analysed built projects - mainly the problems and potentials identified through the project analyses - and propose alternatives that will start from the experimentation with simple architectural gestures on the base design and ultimately evolve into more radical ones, concluding with abstract design guidelines and graphical representations that will help illustrating our vision and aspirations in regards to the quality of the living environments contained within the mixed and dense context of the Big Building.

After having understood the many idiosyncrasies of the process behind each built project, as well as the multiple complex premises that have led to each design decision - and, ultimately, to the final configuration of the built case-studies - we have understood that any design experiment undertaken by us should remain as abstract and theoretical as possible.

It is absolutely not our intention to propose fully-resolved architectural projects as alternatives to the studied examples, but rather to highlight potential alternative ways of undertaking the same project that could have resulted on interesting/ improved forms of living inside the Big Building, in regards to both perceptive and practical levels.

Focusing on that purpose, our design strategies play with invariable and variable premises. The invariable premises are the ones that are normally specified in the general brief of any new project, and also the main parameters dictated by the applicable building code:

- the total built surface and the densification index;
- the range of different programs and areas attributed to each program;
- the setbacks and the maximum built envelopes;
- the volume and the base strategy of the project.

Our approach plays with the existing proposals through experiments with new ways of rearranging the program, new circulation logics and some slight variations in the volume. Our range of variable premises will therefore be:

- the functional diversity and the distribution of the program within the envelope;
- the circulation network within the Big Building;
- the public/semi-public/common spaces planed inside the Big Building;
- the housing layout and some possible alternative housing schemes.

Our proposed alternatives will systematically be nurtured by a range of reference projects (both built and unbuilt) that may illustrate valuable and interesting design strategies. We will also try, as much as possible, to refer to the examples of housing that have been mentioned/analysed in the previous theoretical chapters, highlighting the housing schemes that could have successfully been fit within our abstract design proposals.

Design Model I

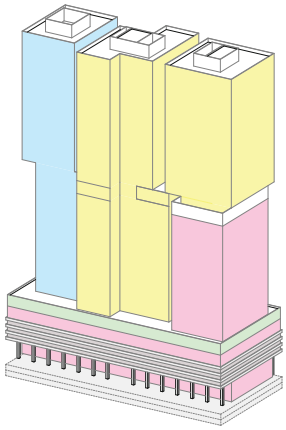
"The Vertical City"

Case - Study I

De Rotterdam

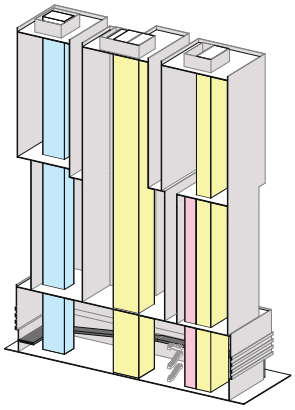
DE ROTTERDAM - EXISTING

PROGRAM



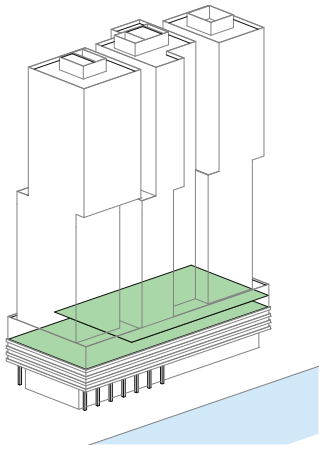
OFFICES
HOTEL
APARTMENTS
PUBLIC/OTHER
PARKING

CIRCULATION



OFFICES
HOTEL
APARTMENTS
PUBLIC/OTHER
PARKING

PUBLIC SPACES



OFFICES
HOTEL
APARTMENTS
PUBLIC/OTHER
PARKING

Images: author diagrams.

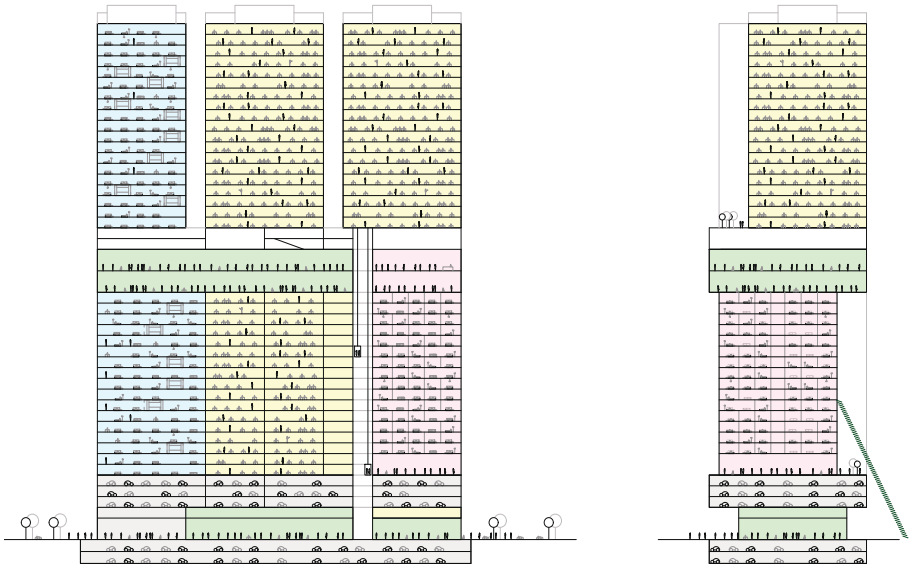
De Rotterdam
Design Strategies

For the project De Rotterdam – our example of 'vertical city' -, we will be exploring a series of design strategies that will take as base the analysis of the original project – the previously identified weaknesses and potentials – to then propose abstract alternative strategies that could potentially result on improved schemes.

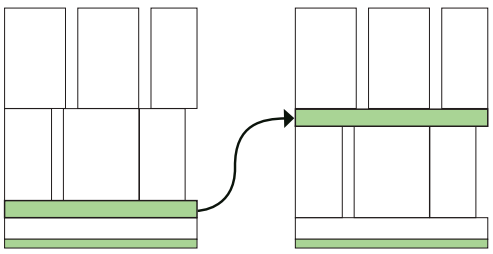
The main fragilities that we have identified in the general analysis of De Rotterdam could be resumed in some fundamental points:
a) the public/shared areas are confined to the podium of the building;
b) above the podium, the different programs are fully autonomous, each one being assigned to one specific tower;
c) the vertical organisation and circulation logics of the building lead to schism between floors;
d) the architecture doesn't provide many opportunities for encounters between the different users, except for the ground floor areas and a few places in the upper levels of the podium;
e) the housing typologies are speculative, repetitive and scantily designed;
f) the concept of living within a Big Building dissipates quite quickly and the housing scheme is ultimately analogue to any random apartment tower.

We have tested three different design strategies following an evolutionary approach, seeking to gradually counterbalance the fragilities listed above. In that sense, whereas the first approach (I) tests a simple displacement of the public floors, the second approach (II) proposes more significant transformations in the volume and layout, bearing a conciliation of vertical and horizontal logics; finally, the last hypothesis (III) is the one that explores the broadest range of potentials that we would have imagined for the general concept of housing in a vertical Big Building, bearing a final conciliation of all three hypotheses, and hence being graphically illustrated more intensively than the first two hypotheses.

The images and diagrams developed for each hypothesis do not intend to represent resolved projects, but rather to illustrate some abstract ideas that could lead to some improvements on the overall architectural scheme of a vertical Big Building.



OPERATION



Images: author diagrams.

De Rotterdam
Design Strategy I

Step 1. Moving public space to a higher level, with direct access from the street

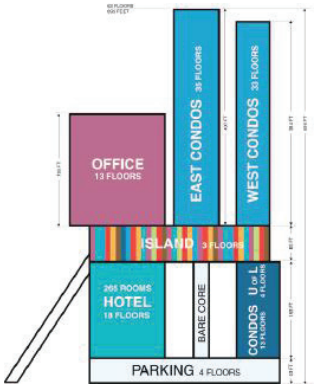
Step 2. Improving the design of the dwelling typologies

In a first design study, we have tackled what we consider to be the two most clearly identifiable weaknesses of De Rotterdam: the fact that the public/shared space is contained within the podium of the building (finishing on level 6, with all the other uses being segregated in three independent towers above) and the fact that the dwelling typologies, regardless of their arrangement of 'typical plans', are dull and barely meet the supposedly high-standard category they aim at.

In that sense, we have tested moving the public space, from its location at the 5th and 6th floors to a higher position - mid-height within the volume - and make it directly accessible from the street, in a way that this space could really function as a heart of animation and also as the centre of distribution of the overall circulation within the building: the space from where all the different programs can evolve and where the multiplicity of users and also the public are invited to meet naturally and regularly, just as in any other public space of the city. Simultaneously, we have kept the original public program at the ground level, which somehow succeeds at mingling the disruption between the urban life of the city and the inner life of the building.

As for the housing towers - while maintaining in a first moment, the organisational logic of the overall program - we have noticed, based on some particular examples of housing that have earlier been analysed, that there would be some advantages in tapering the squarish footprint of the housing towers into a rectangular one (see "Typical Plan in p. 115), in order to enable the planning of more interesting and better-organized housing typologies.

REFERENCE PROJECT



MUSEUM PLAZA
OMA/REX, LOUISVILLE, KENTUCKY, 2005

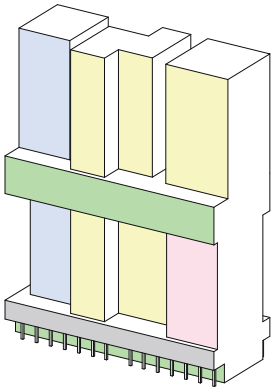
STATE:	UNBUILT
TOTAL AREA	141 800 m²
CONTEMPORARY ART CENTRE	3 700 m²
UNIVERSITY OF LOUISVILLE	2 300 m²
OFFICE	25 000 m²
HOTEL	250 rooms
HOUSING	117 studios
RETAIL	1 900 m²
PARKING	800 CARS

Museum Plaza is a 62-story hyper-rational tower project —part kunsthalle museum, part residential and commercial hub, part art school— and was hoped to signal the rejuvenation of its city's urban core. Culture is placed physically and spiritually at the project's center. Original plans set forth in early 2006 called for a modern art museum on the 23rd floor, accessed by a diagonal funicular, to form the hub between hotel, residential, and office space. A massive park atop a parking garage, originally designed by West 8 Landscape Architects and then turned over to artist Ned Kahn, formed the plaza. The plinth of public program (the "Island") is elevated and the towers and circulation are evenly distributed above and below.

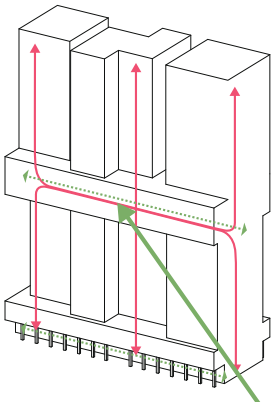
SOURCES: Full description extracted from:
http://www.rex-ny.com/museum-plaza/
a+t, *This is Hybrid*, Vitoria-Gasteiz, 2014

I. General Strategy

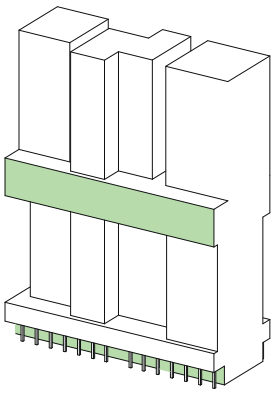
PROGRAM



CIRCULATION

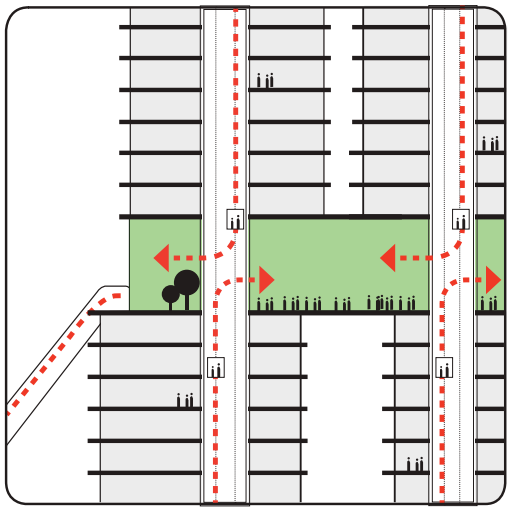


PUBLIC SPACES



Through a simple change on the layout, we can observe that the building incrases in complexity. In some points, and beyond the clear reference to OMA/REX's Museum Plaza's project, the functional scheme may recall the Elbphilarmonie, which also intends to bring inhabitants from the street directly to the heart of the building through a public escalator [see chapter 2]. On the other hand, such scheme may also recall the description of the Downtown Athletic club, with an area of confluence located at a mid-height within the building, where the fluxes of the lower and upper floors, as well as the public coming directly from the outside, would finally find a gathering point.

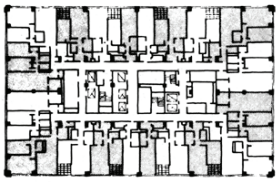
Programmatically, we achieve a wealthier diagram, the circulation logics change substantially towards a higher complexity, and the distribution of public spaces becomes more balanced .



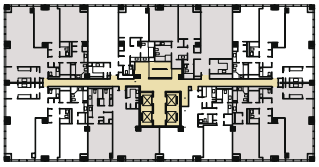
Images: author diagrams.

II. Housing

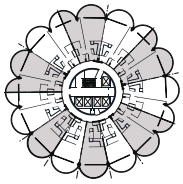
REFERENCE PROJECTS



JOHN HANCOCK CENTRE, SOM - TYPICAL APARTMENT FLOOR

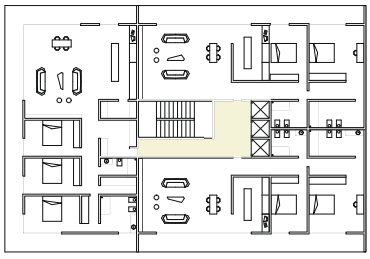


OLYMPIC TOWER, SOM - TYPICAL APARTMENT FLOOR

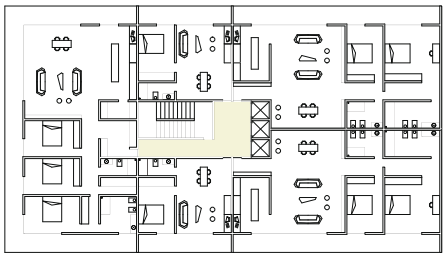


MARINA CITY, BERTRAND GOLDBERG

LAYOUT HYPOTHESES



TYPICAL FLOOR PLAN HIGH

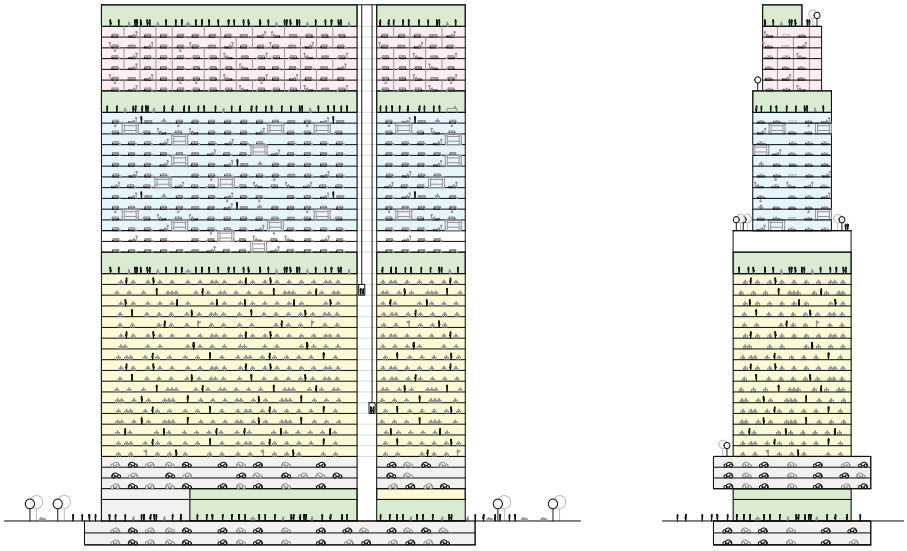


TYPICAL FLOOR PLAN LOW

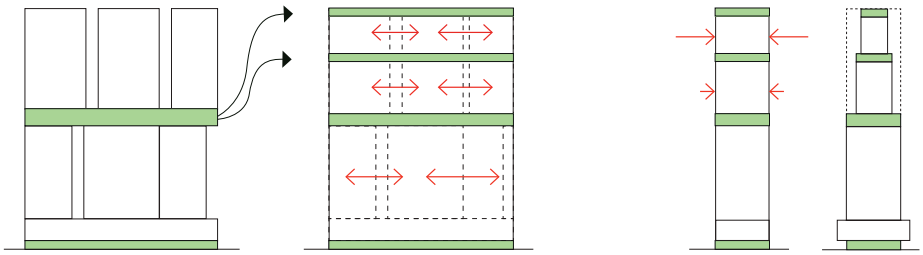
Although the projects with this kind of typology bear normally speculative layouts, as well as floor plans that are repeated in the totality of the different levels of the building, we believe that the design of this building could have embodied an improved model, as the ones seen in its precedents in America. Yet, on contrary, the scheme is a lot less balanced in terms of proportions and functionality of each apartment than its precedent models.
In that sense, it is important to refer to the case studies analysed in chapter 02 to understand that this model could have been developed more in depth. The Marina city building, for instance, despite being very different in terms of its shape and also bearing a very peculiar layout, ended up triggerering a housing typology that was really innovative and that offered qualities that couldn't be found elsewhere.

Another two previously analysed examples of vertical hybrids may also be exemplary: the John Hancock Center (Chicago) and the Olympic Tower may also be interesting references regarding the proportions, areas and interior distribution of the dwellings. One thing we have noticed is that these plans are not completely square, but rather rectangular, allowing for a more balanced design of the ousing schemes.

To sum up these thoughts, we have designed ourselves a possible layout (merely hypothetical) that could represent an alternative to the existing layout of housing at De Rotterdam and that could potentialy improve some of the flaws that have been highlighted in the analysis of the building.



OPERATION



Images: author diagrams.

De Rotterdam

Design Strategy II

Step 1. **Exploring horizontal circulation logics**

Step 2. **Adding new levels of public space, creating a series of horizontal public spaces distributed along the volume in height , and connected by a public circulation core (as the public space of the city)**

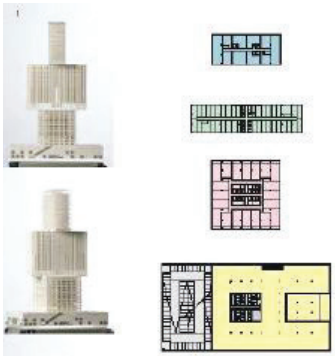
Step 3. **Superposing volumes of different depths and using the resulting terraces as exterior prolongations of the public spaces**

Through the project analysis, we have understood that the stratification of the program in different towers, each with a central vertical core, would lower the potential for the architectural exploration of the volume in terms of its inner dynamics and social events. However, and unlike what has been acknowledged in the previous chapters, whereas the American examples had a restrained footprint because of the grid, the building De Rotterdam, with its 108 m lenght by 50 m depth total footprint, would bear more than enough potential for the exploration of horizontal circulation logics within a high-rise scheme (an obvious reference to Le Corbusier's *Unité d'Habitation*).

In that sense, we have decided to rework the scheme into different horizontal volumes stacked vertically, each bearing a different depth that would adapt to its own specific use. The deeper one is at the bottom and holds the office area. Above, with a reduced depth, the housing area is organised around central double loaded distribution corridors (or 'corridor-streets') with alternating floors of duplex and single floor apartments. The terraces that result from the different depths of the stacked volumes explore the potential identified, at a smaller scale, on the terrace of the existing hotel bar at De Rotterdam, and follow also the strategy that has been explored in the 111 First Street project; we imagine these areas as exterior prolongations of the interior public areas, potentially becoming green areas, exterior lobbies for office workers or recreational areas and playgrounds for the families.

The understanding of the program as a vertical network of circulation and public space starts becoming clearer, and the scheme starts to successfully reproduce the circulation logic of an urban fabric developed vertically, recalling the principles that have been explored in OMA's 2006 project Dubai Renaissance [see chapter 2].

REFERENCE PROJECT



111 FIRST STREET
OMA, JERSEY CITY USA, 2006

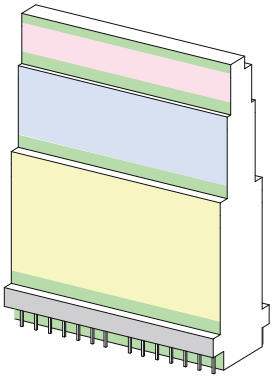
STATE:	UNBUILT
TOTAL AREA	111 483 m²
RESIDENTIAL	53 418 m²
PARKING	22 296 m²
HOTEL	19 509 m²
RETAIL	8 082 m²
MUSEUM / GALLERY	1 765 m²

111 First Street is a high-rise mixed use building located in Jersey City's burgeoning waterfront development. The programme is stacked in three different volumes on top of a socle. Each volume holds different uses and housing typologies: programmatic variations impose building formalization and it is interesting to notice how the volume stretches in order to allow each programme to have the most efficient plan in terms of depth/proportion. Volume rotation allows for the opening of exterior terraces. One of them, on the roof of the socle, can be directly accessed from the street so as to incorporate it in the circuit of public activities of the surrounding cultural district. The public space inside, at the base, at a mid-height level and at the roof, can be used day and night, bringing new densities for vertical and horizontal transit.

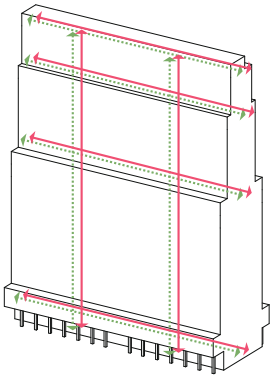
SOURCES: Full description extracted from:
http://oma.eu/projects/111-first-street
a+t, *This is Hybrid*, Vitoria-Gasteiz, 2014

I. General Strategy

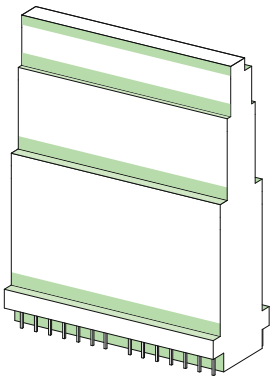
PROGRAM



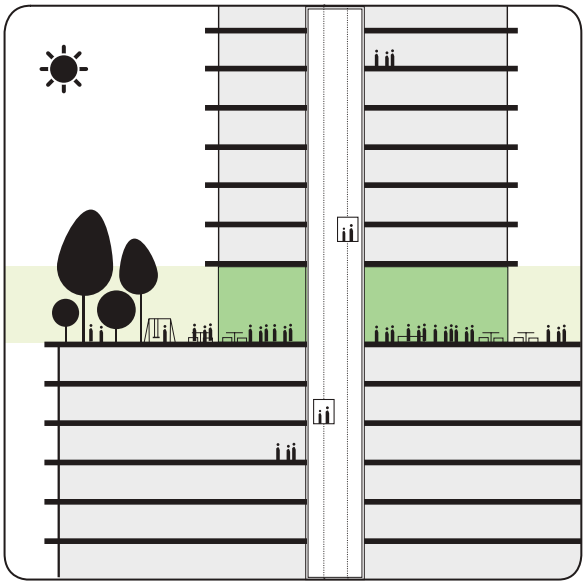
CIRCULATION



PUBLIC SPACES



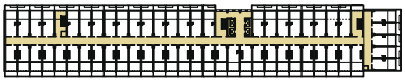
In this second design strategy, we experiment a shift on the circulation system of the building, adapting the depth of the new horizontal volumes to each different use. The circulation system becomes more complex, recalling the idea of an urban grid, though developed vertically. However, from the inside of the building, this idea of a thrilling urban articulation may dissipate fast, as the common floors are just regular floors linked by vertical cores, and the users are not necessarily stopping by, nor perceiving the programmatic diversity when standing in different floors. Although in the example of the John Hancock centre we found it interesting to discover common uses spread out through different heights of the building [see chapter 2], we believe that a thrilling concept of 'life within the Big Building' would call for a higher complexity on the visual perception of the ensemble and the connections between uses, just as when one walks through the city. The potentially interesting spaces (that could enhance this sense of complexity) would result from the tapering of the building, and would be the large exterior terraces – these would bear witness to the enhancement of an interesting space/feature of the existing building: the balcony at the hotel bar/restaurant. In this strategy, we would imagine the addition of such spaces at the lower level of each program, as a large communal area - with interior and exterior space in close articulation. For example, for the office area, this could be a large foyer for the workers whereas, for the housing units, different features could be created such as exterior playgrounds, interior meeting areas, fitness rooms, etc.



Images: author diagrams.

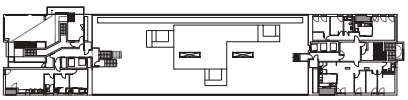
II. Housing

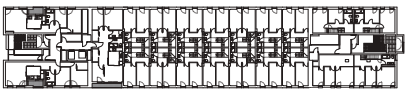
REFERENCE PROJECTS



UNITÉ D'HABITATION

SILODAM, MVRDV



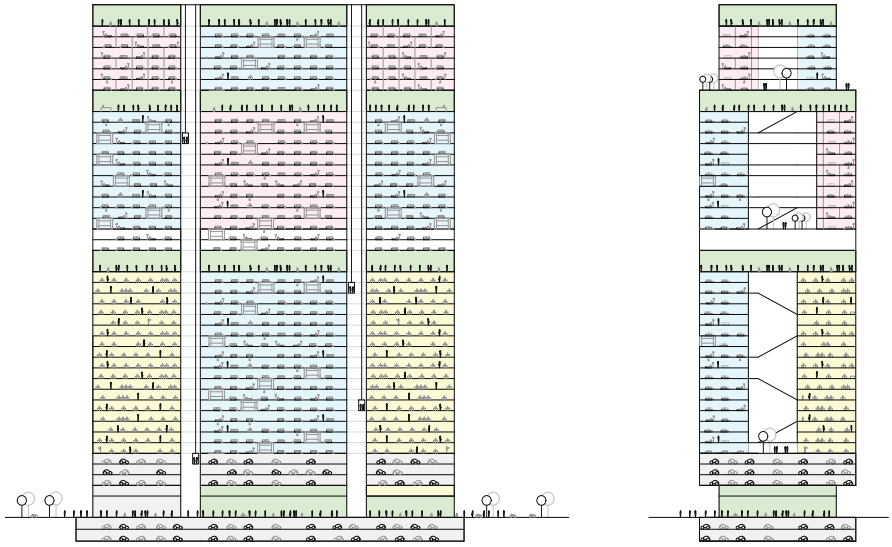


EL MIRADOR, MVRDV

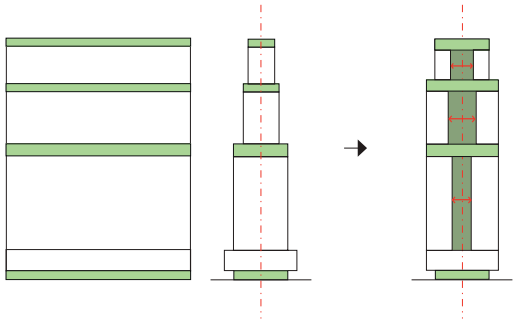
Our analysis of the housing scheme built at De Rotterdam has highlighted a series of fragilities that had to do with the footprint of the housing tower (the apartments becoming deep and narrow when stretched to adapt to the tower shape) and sun exposure, with some apartments being exclusively north oriented.

If the apartment volume was horizontal, there would be many advantages for the housing. On the one hand, it would be possible to work with horizontal distribution double loaded corridors that would reinforce the sense of neighbourhood. By doing so, it would be possible to explore duplex typologies, allowing for the possibility of planning cross-ventilated apartments that could simultaneously enjoy the south light and the north view over the Maas. Moreover, there would be a much bigger freedom to explore different apartment sizes and typologies.

The obvious reference for the housing scheme we are referring to would be Le Corbusier's *Unité d'Habitation*. As mentioned above, Le Corbusier intended to explore the logics of neighbourhood through the establishment of an inner distribution corridor-street that, in this case, and unlike Le Corbusier's scheme, could be lit on both ends. Aside with Le Corbusier's reference, many other buildings which have declaredly been inspired in this seminal scheme – like the projects of MVRDV or BIG, explored in chapter 2 – could bear equally interesting references to nurture our design experiments.



OPERATION



Images: author diagrams.

De Rotterdam
Design Strategy III

Step 1. Exploring the idea of self contained city through communicating terraces in the interior of the building

Step 2. Improving Housing Typologies

Step 3. Exploring functional diversity and visual communication between different uses, reproducing the dynamics of the city;

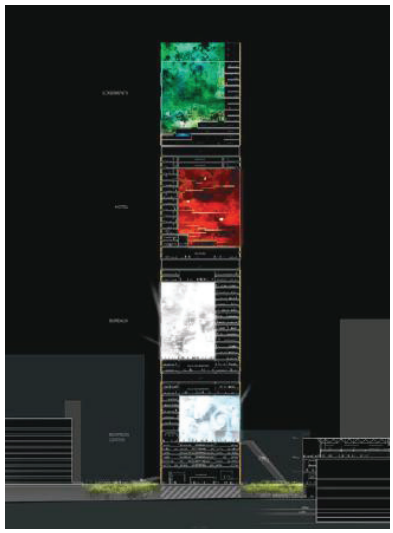
Having understood that, despite the increased number of public spaces proposed in the Strategy II, these would still bear limitations in the number of interactions between users. We have therefore decided to experiment organising the different programs around large interior terraces that would also compose an inner landscape. The different programs would be located around these terraces and there would always be visual contact between the users of each program. The different programs would be organized horizontally, and articulated with a reticule system of vertical and horizontal circulations.

The housing typologies would be organized on a gallery system whose access 'streets' would be turned towards the inner terrace, as a system of 'streets in the air' hanging above the inner courtyard. The access to the offices and the hotel would be organized in the same logic of access galleries.

Through this solution, we have reached the desired image of a self-contained city hosting an innovative living environment, which would look more like a city and less like a building: the idea of 'urbanism within a volume', exploring the complexity of different levels, public spaces, landscape, connections, public and semi-public areas.

For this third design strategy, we have produced some graphic representations that illustrate the concept of what we consider to be a thrilling exemple of functional diversity, and a truly exceptional condition of living in the Big Building.

REFERENCE PROJECT



TOUR DU SIGNAL,
JEAN NOUVEL, PARIS, 2008

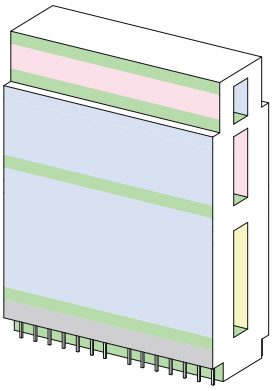
STATE:	UNBUILT
HEIGHT:	301 m
TOTAL AREA:	140,000 m²
OFFICES :	50,000 m²
RESIDENTIAL:	33,000 m²
HOTEL:	39,000 m²
PUBLIC FACILITIES :	8,000 m²
RETAIL, RESTAURANTS:	10,000 m²

The regeneration plan for La Défense area in Paris included several high-rise sustainable towers, one of them being the Tour du Signal. The monolithic volume of the tower houses four sectors stacked vertically and separated by technical floors. Each sector holds a different use (from bottom to top: retail, offices, hotel and housing), organised around large interior terraces. The fact that the building holds these animated interior spaces would have allowed for a full perception of the events taking place within the building, and thus users would feel the thrill of inhabiting a truly animated self-contained city within the city. These voids at the heart of the building allow for natural light to enter the space, which wouldn't feel like an enclosed space. The organisation of the programs around the terraces allows for a smaller depth of the plans, and thus housing and offices would also benefit from efficient layouts and good natural light.

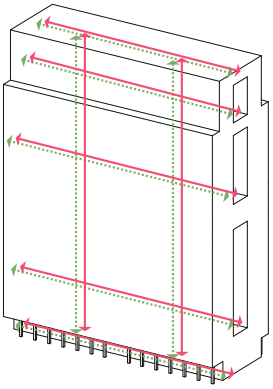
SOURCES: Full description extracted from:
http://oma.eu/projects/111-first-street
a+t, *This is Hybrid*, Vitoria-Gasteiz, 2014

I. General Strategy

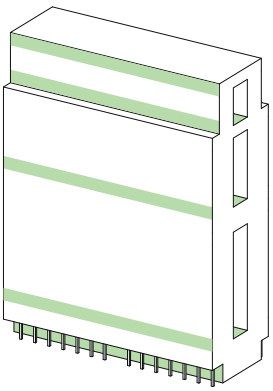
PROGRAM



CIRCULATION

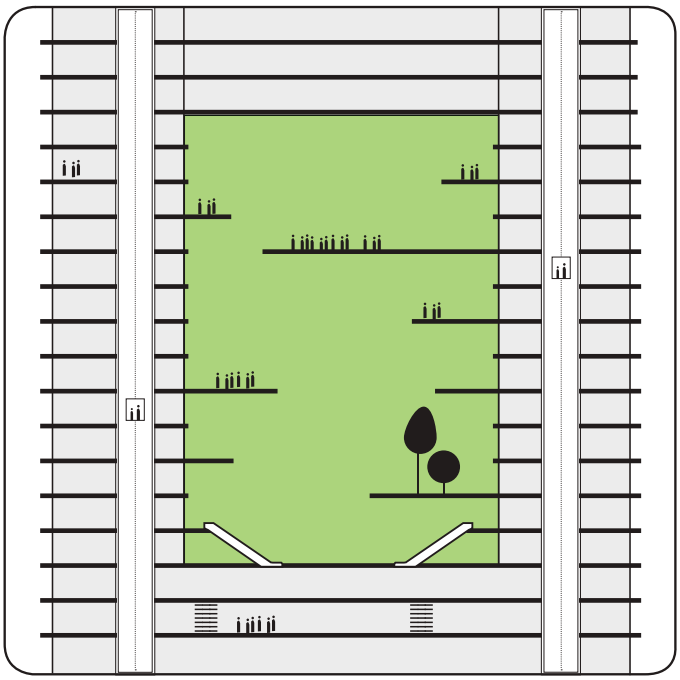


PUBLIC SPACES



Although the hypothesis II envisioned an interesting horizontal and vertical circulation network, as much as it contained a balanced integration of communal uses distributed along the height of the building, we understood that the perception of life within a mixed and complex Big Building could dissipate quite easily, and therefore it would be pertinent to test a more radical solution.

In that sense, the concept of this third strategy focuses on a more radical strategy, which concentrates the distribution channels of the building around large internal courtyards. Indeed, the access to housing, offices and hotel would be made through a system of 'streets-in-the-air' hanging over this large internal space, recalling the strategy used by Jean Nouvel for the project of the *Tour du Signal*. This naturally lit nucleus would be the central public space of the building: a landscaped acclimatized area inside the building that would be the central confluence point of the multiple different users. It would be interesting to think that an inhabitant leaving home in the morning could see an office worker reaching his workplace in the opposite façade; or that this same inhabitant could actually have his workplace on the opposite façade, with a dynamic internal environment in between.

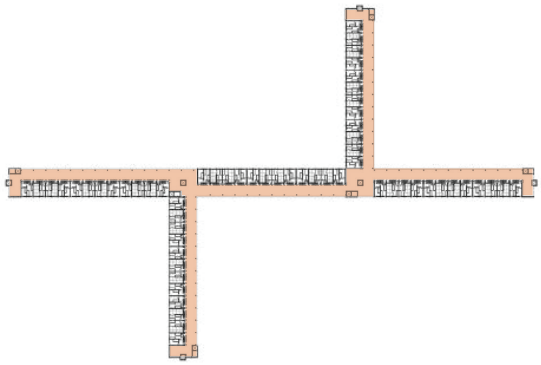


Images: author diagrams.

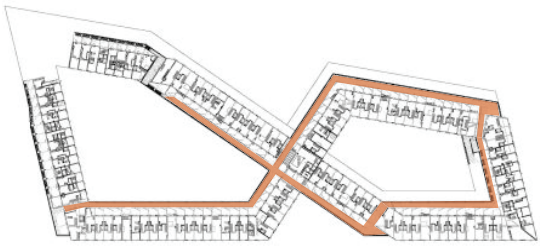
II. Housing

REFERENCE PROJECTS

[1] NARKOMFIN DOM-KOMUNA, M. GINZBURG (1928-32)



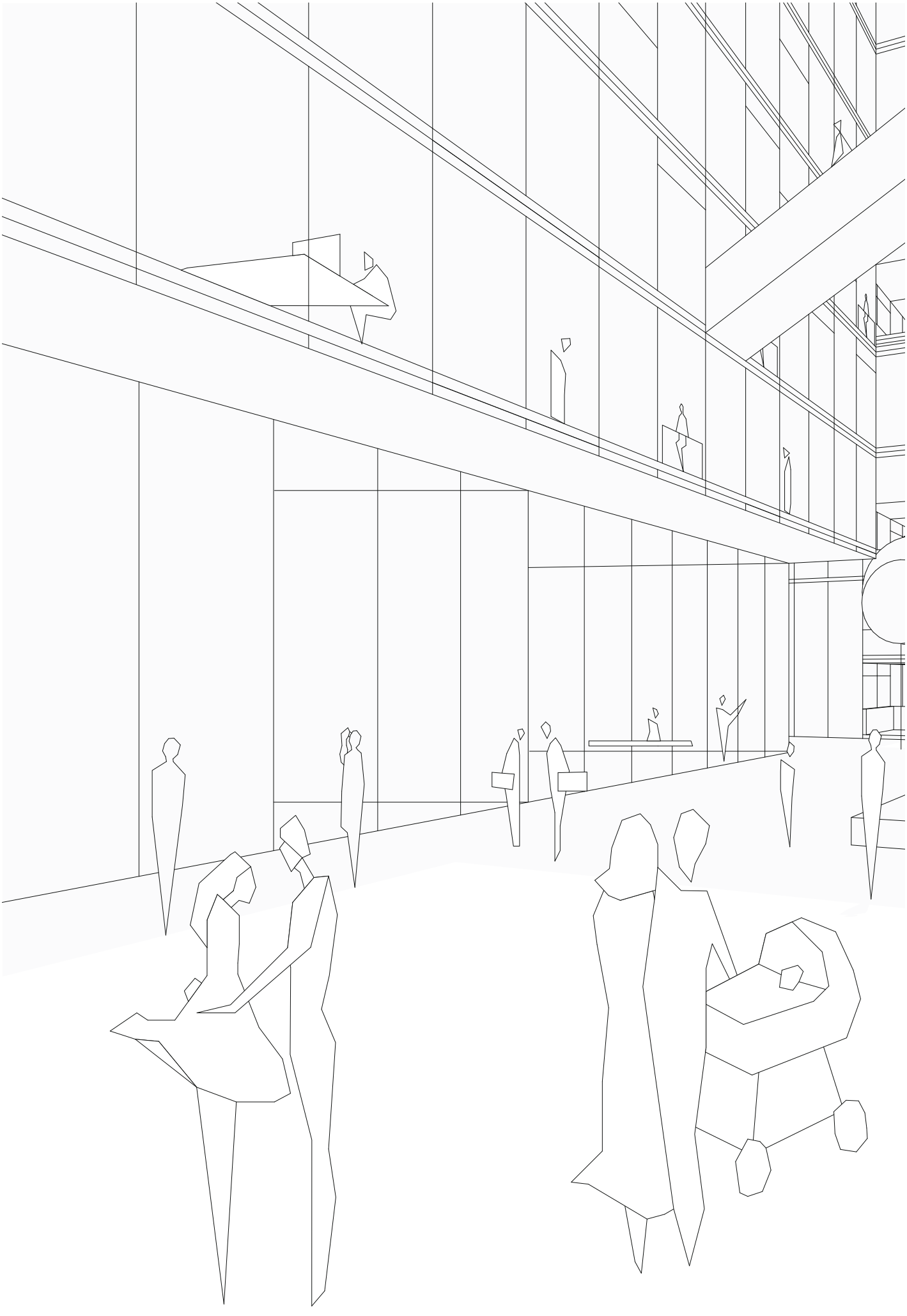
[2] GOLDEN LANE, ALISON & PETER SMITHSON

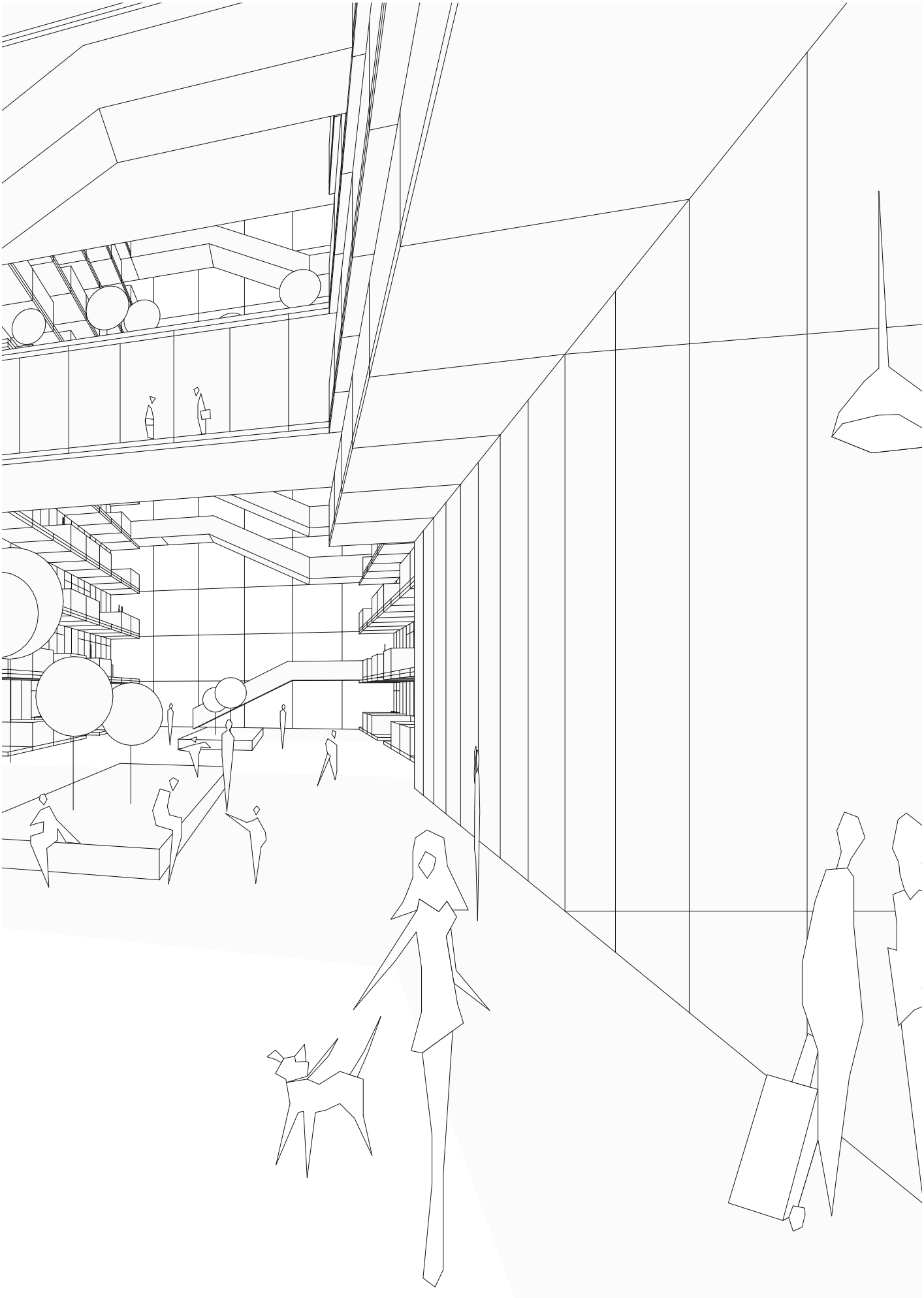


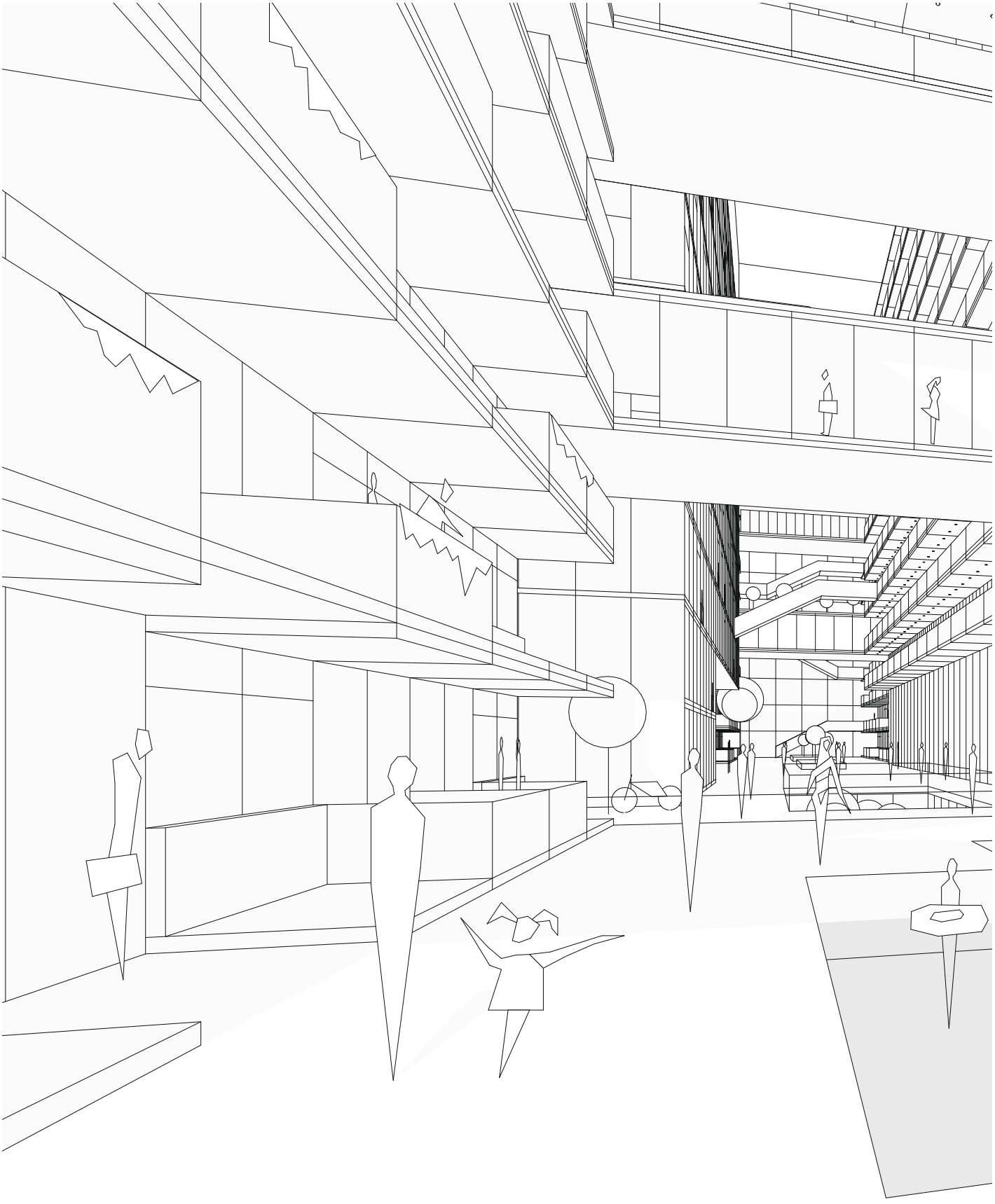
[3] 8 TALLET TYPICAL PLAN, BIG

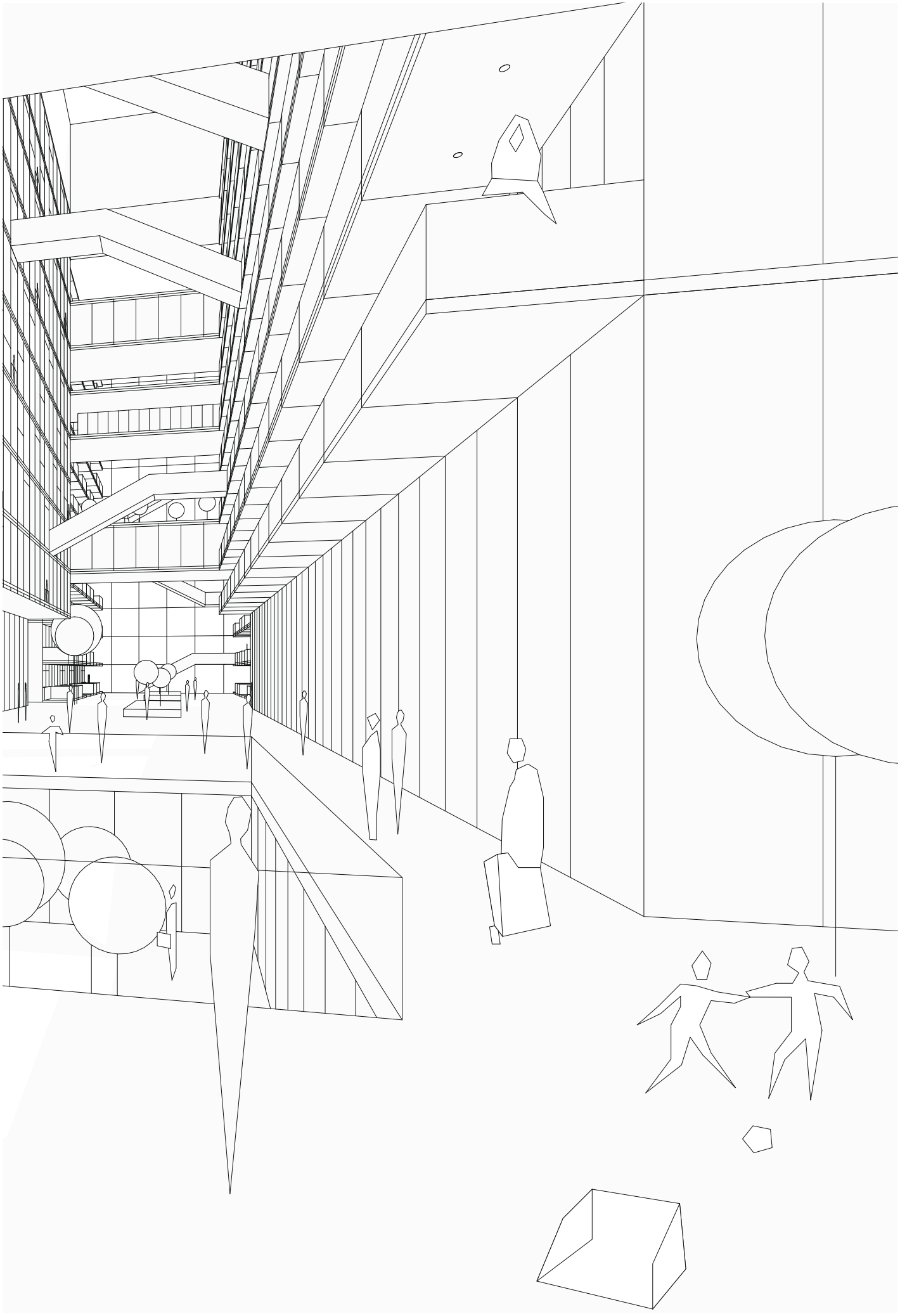
The housing typologies to be planed within this scheme would be accessed from corridor streets suspended over the central courtyard, and therefore the dwellings would be oriented south (with the possibility for some secondary openings towards the inner courtyard). The shallowness of this housing wing would allow for the planning of well-lit typologies – correcting the depth issues observed in the built model - and the horizontal layout would leave space for typological diversity, namely one-floor and two-floor apartments of different sizes.

Yet the truly innovative idea to be enhanced within this strategy is the access to the houses being made from a truly active shared communal area at the heart of the building. This would recall the principles enhanced by Alison and Peter Smithson on the importance of the street and the communal space [see chapter 1] before reaching the apartment space itself. Finally, in this third strategy, we seem to attain the suggestion of a certain uniqueness of a living mode that would only be possible to be explored within a Big Building - the concept of living in a context of 'self-contained urbanity' [see images in the next pages] .









Design Model II

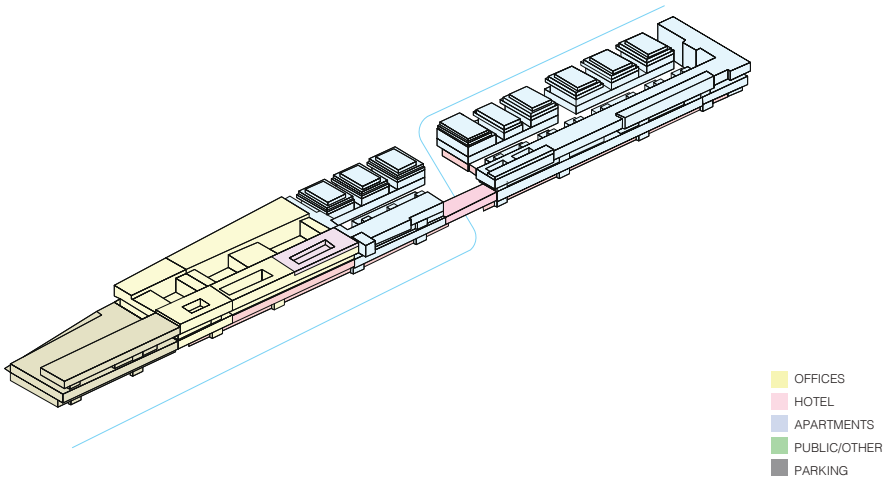
The horizontal
"City within the City"

Case - Study II

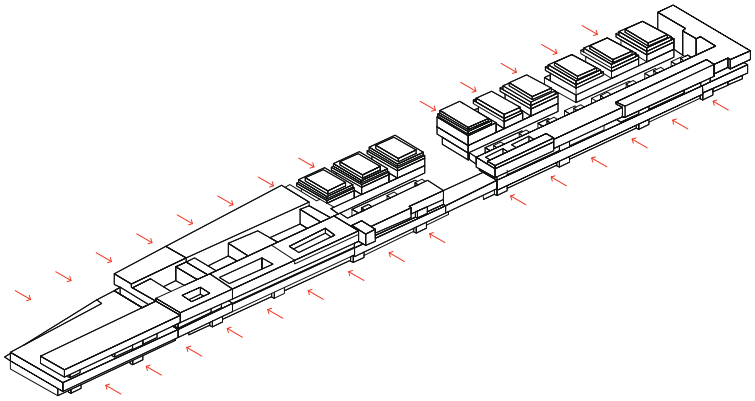
Entrepôt Macdonald

ENTREPOT MACDONALD - EXISTING

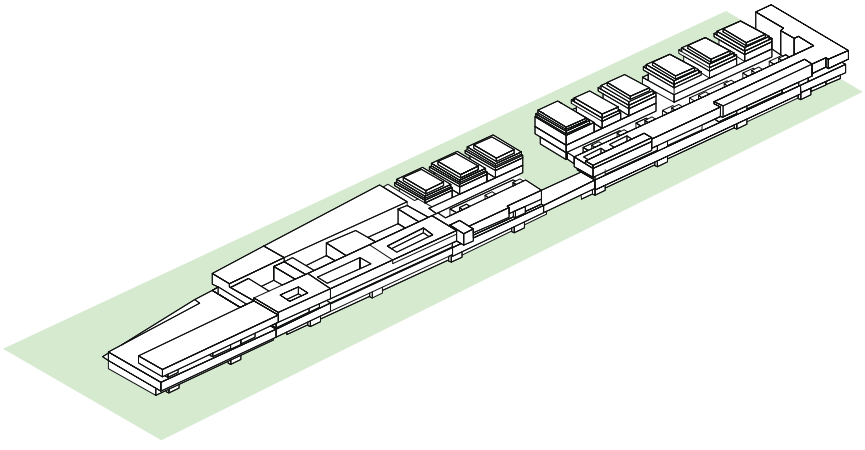
PROGRAM



CIRCULATION



PUBLIC SPACES



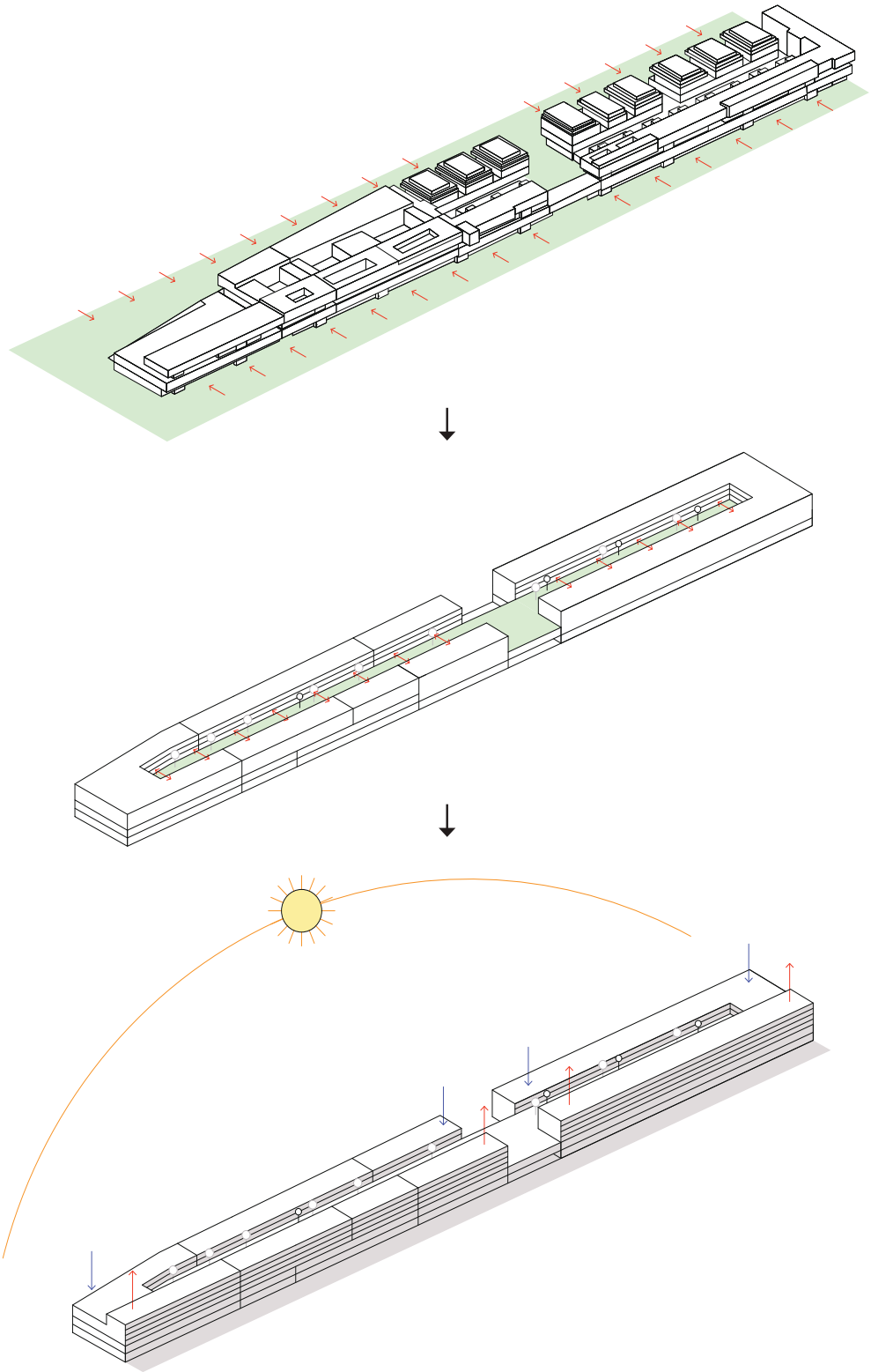
Images: author diagrams.

Entrepôt Macdonald
Design Strategies

Following the same method used for the design experiments that took as base the building De Rotterdam, our design strategies will depart from the built project of the Entrepôt Macdonald and will tackle the problems and potentials identified through the project analysis, proposing abstract alternative strategies that start by seeking the improvement of the project and culminate on the development of an abstract 'ideal' solution of a horizontal Big Building.

The Entrepôt Macdonald contains, a priori, all the necessary ingredients to become an exemplary paradigm of a horizontal Big Building, where multiple functional layers and social types could be intertwined into a complex spatial network of circulation and articulation spaces. However, the reality found in the built scheme is rather deceiving, despite its intense functional and social mix. The main fragilities that we have identified in the general analysis of De Rotterdam could be resumed in a few main points:
a) there are no public/shared areas within the building - all the social activities are restrained to the street;
b) the different functions of the building are divided into sectors: housing, offices and school, except for the retail activities at the ground level;
c) each 'slice' of program/housing block has an independent access from the street - a juxtaposition of many small buildings and not one articulated building;
d) the housing scheme, although varied, does not provide many possibilities for social interaction;
e) the housing is poorly planed, reveals close proximity between the juxtaposed housing blocks and multiple vis-a-vis issues can be identified;
f) some apartments are oriented exclusively north and have views only to the inner courtyard.

The strategies that we will explore in the next pages will experiment with the possibility of conceiving this building as one Big Building: a more articulated system that takes benefit from the pre-existing 'one building' scheme, explores the inner courtyard and triggers new strategies for the interaction between users and uses.



Images: author diagrams.

Entrepôt Macdonald
Design Strategy I

Step 1. **Clarifying the concept of the Entrepôt Macdonald as One Big Building deployed horizontally, by simplifying the volume**

Step 2. **Replacing the multiple entrances with one main entrance, allocating all the circulation network to the inner space**

Step 3. **Tappering the volume to improve the penetration of sunlight**

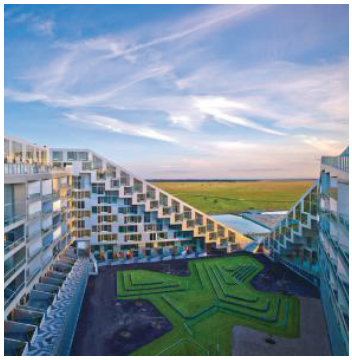
Step 4. **Icreasing the dimension of the inner courtyard and turning it into a generous public/semi-public garden**

Step 5. **Improving the variety and quality of the housing schemes**

This first design strategy seeks to clarify the building's volumetric and functional scheme and to tackle the main issues that have been identified in the overall analysis: the sunlight and privacy issues that result from the reduced space between the different 'bits', the functional fragmentation and the residual character of the inner courtyard.

This strategy is, in many points, nurtured by the qualities observed in the examples analysed in the theoretical chapters, like the 8 Tallet, the Barbican and other projects developed by the Team 10.

REFERENCE PROJECT



8 TALLET
BIG, COPENHAGEN, 2010

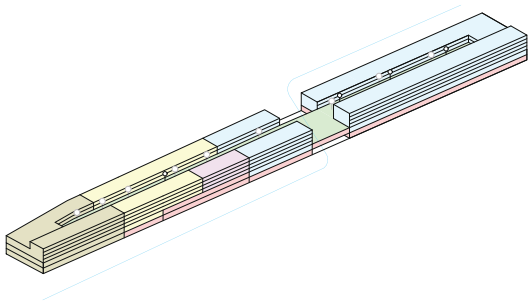
The building 8 Tallet, by BIG, contains three different types of residential housing and 10,000 m^2 of retail and offices, being Denmark's largest private development undertaken ever since. Rather than a traditional block, the 8 House stacks all ingredients of a lively urban neighborhood into horizontal layers of typologies connected by a continuous promenade and cycling path up to the 10th floor creating a three-dimensional urban neighborhood where suburban life merges with the energy of a city, where business and housing co-exist.

Something particularly thrilling is triggered within the scheme of 8 Tallet: the reproduction of urban elements, like the street that is present in the overall project, as well as the housing by the street.

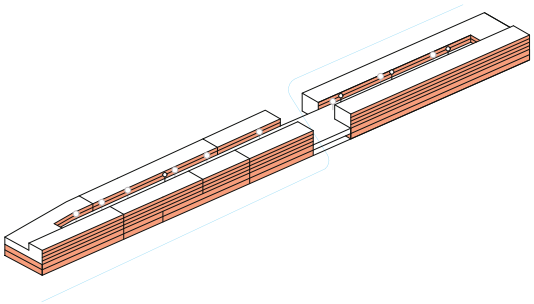
SOURCES: Full description extracted from:
http://www.big.dk/#projects-8
http://www.archdaily.com/83307/8-house-big

I. General Strategy

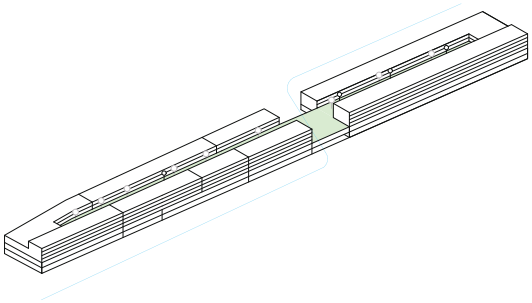
PROGRAM



CIRCULATION



PUBLIC SPACES

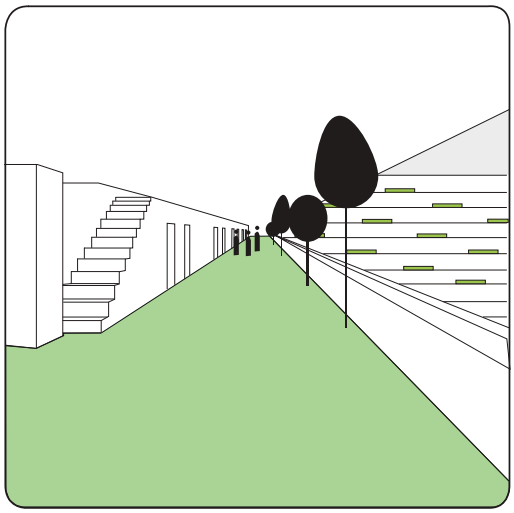


This first design strategy tries to reinforce the concept of one horizontal Big Building organized around a public/semi-public inner courtyard. The shape of the volume is simplified and unified, in line with the pre-existing warehouse building (which is supposedly being reconstructed through this project). The multiple separate entrances seen in the built scheme are replaced by one entry point, and then all the circulation and the accesses to the different programs take place from the inner space of the building.

The volume has been tapered according to sun exposure. Following the same logics that have been seen in some reference projects like the 8 Tallet or the West 57 by Big, the south wing has been lowered in order to allow sunlight to penetrate into the inner patio and also illuminate the opposite wing.

The north wing, on its hand, has been increased in height and its main façade has become the one that is turned towards the patio, being that the north façade will be where the access gallery will be located, putting the 'streets-in-the-air' in contact with the boulevard.

In this first strategy, the program distribution in different sectors, as well as the retail podium at the ground level, have been kept.



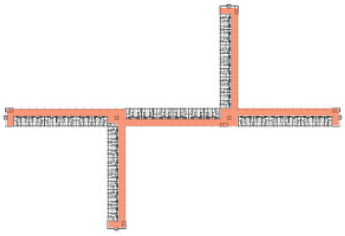
Images: author diagrams.

II. Housing

REFERENCE PROJECTS

[1] 8 TALLET TYPICAL PLAN, BIG

[2] WEST 57, BIG, MANHATAN, 2016



[3] GOLDEN LANE, ALISON & PETER SMITHSON

[4] PARK HILL, LONDON

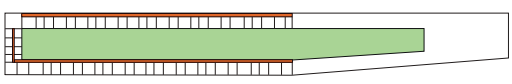
POSSIBLE LAYOUT

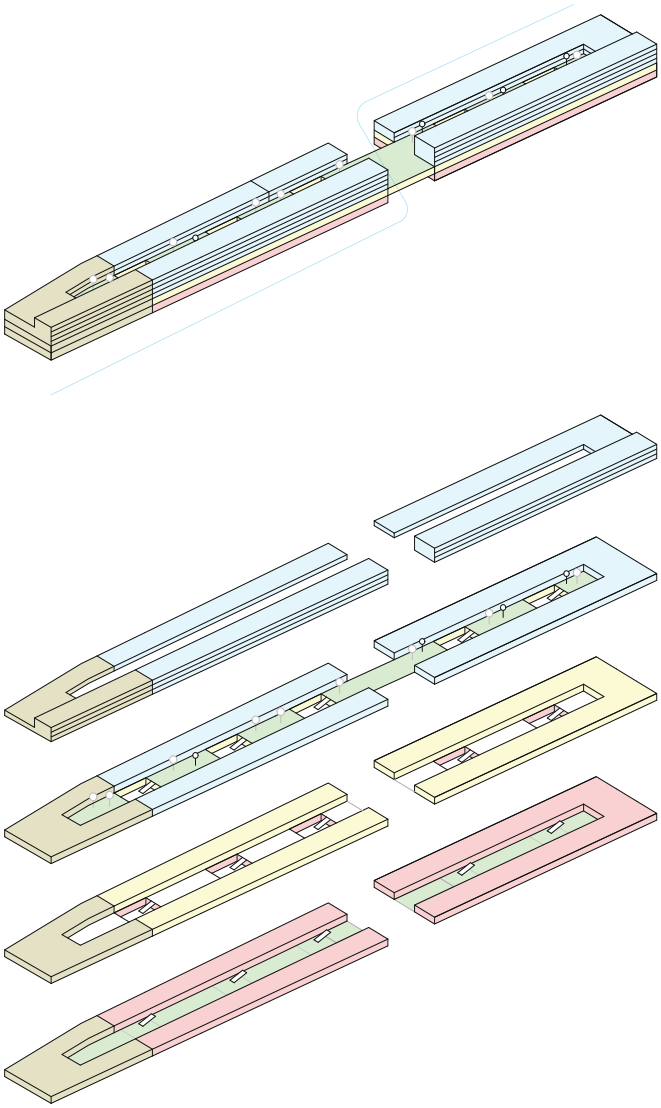
The concept of 'streets in the air', around the inner patio, could become a potentially interesting motto for the development of housing, nurturing from the examples analysed in the theoretical chapters. The neighbourhood life of the building would evolve around this space, which would be the major shared space to all the inhabitants. The visual contact and the path that the inhabitants would have to take in order to reach their home door would reinforce the sense of community life in a simple and natural way. This idea clearly nurtures from the principles of community life and the 'street in the air' concept proclaimed by Alison and Peter Smithson (see chapter 1), following also the strategies applied in BIG's reference projects 8 Tallet and West57. The Gallery access typology allows the volume of the housing to be thinner and consequently, the central green courtyard becomes more generous.

At the same time, a greater typological diversity may be explored (as seen in the project 8 Tallet or the Barbican), comprising terraced houses at the lower levels and penthouses on the upper floors.

We have taken as reference the Golden Lane (Alison&Peter Smithson, 1952) concept, as a clear allusion to the concept of 'streets in the air' and the elevated streets as a form of accessing the different homes. Although the Golden Lane project hasn't been built, most of its principles - and mainly the importance of the wideness of the 'streets' - have been realized later in projects such as the Robin Hood gardens (Alison&Peter Smithson, 1972) or the Park Hill project (Jack Lynn Ivor Smith, 1957-61), which is still a successful example of a large scale housing building nowadays.

The fact that, in this strategy, the apartments at the side of the Boulevard Macdonald are facing the courtyard, would allow the inhabitants to have a permanent awareness of the concept of 'living in a Big Building', permanently full of life, diversity and relational complexity.





MULTIPLE DIFFERENT TYPES OF CROSS VENTILATED APARTMENTS, WITH GALLERY ACCESS ON THE NORTH FAÇADE

HOUSING AROUND THE CENTRAL GREEN COURTYARD (TERRACED HOUSES AT THE LOWER LEVEL)

AN OFFICE LAYER WITH COURTYARDS LINKED BOTH TO THE COMMERCIAL FLOOR AND TO THE RESIDENTIAL FLOORS

A LOWER COMMERCIAL LAYER WITH SMALLER COURTYARDS. OFFICE WORKERS, INHABITANTS AND PUBLIC ARE ALLOWED TO USE THE COURTYARDS.

Images: author diagrams.

Entrepôt Macdonald
Design Strategy II

Step 1. the program is redistributed into a system of superposed horizontal layers

Step 2. the interior garden is sculpted into multiple interconnected public/semi-public levels

Step 3. the typological diversity of housing is accentuated

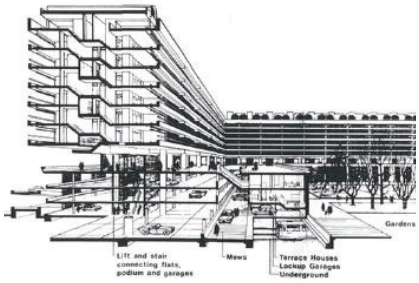
In this strategy, the main potentials that we have imagined for an 'ideal' horizontal solution for a residential Big Building are finally explored. We have worked on the idea of a spatially complex and thrilling living environment - both for the inhabitants and for the users of the different programs - in a way that they effectively share a large common envelope without interfering with the efficiency, privacy and security of each program. Instead, the coexistence of different uses and the consequent liveliness of the building all day long are expected to ensure the balance of the building life and also to strengthen the bond between the building and the city.

This solution reintroduces the program distribution scheme initially defined in OMA's masterplan for the Entrepôt Macdonald - the 'double-mac' principle - recalling the precepts of the *urbanisme sur dalle*. The mat-building principles may also bear an interesting reference to this scheme.

As seen in the Barbican reference, we have imagined the building as a walled town (though keeping the commercial program at the ground floor, and thus ensuring the link between building and city), focusing on the strategies that could stimulate the inner community life and potential interactions between the different uses and users. The Barbican is also an important reference in what relates to the diversity of housing typologies.

This strategy is illustrated through three-dimensional graphic representations in the next pages.

REFERENCE PROJECT



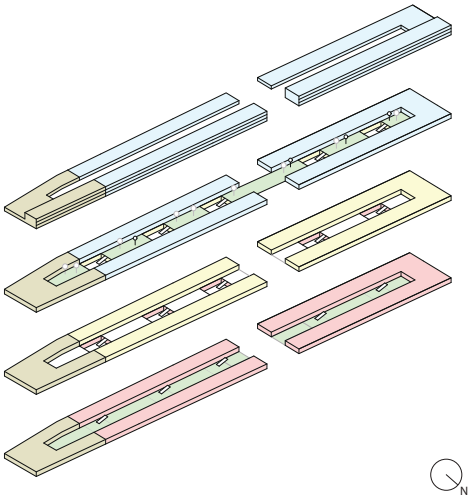
BARBICAN
CHAMBERLIN, POWEL & BON, LONDON 1955-83

The whole Barbican Estate has been designed to resemble a small walled town which helps provide both privacy and protection from noise, and yet it benefits from a central position within the city, containing equipments that constantly invite external users to come and experience the inner life of the complex.
To offset the high cost of land there is a very dense concentration of buildings. The Barbican development has a total of 2,018 flats however there is still a considerable sense of openness due to the skilful use of space. If one takes into account the various levels of car park space, the podium area, the gardens and the building space itself, the total pedestrian area of the Barbican is nearly twice the actual size of the site. The intention underlying the design was to create a coherent residential precinct - a convenient and pleasant environment affording residents the opportunity to move freely around enjoying constantly changing perspectives of terraces, lawns, trees and flowers against the background of buildings or reflected in the lake.

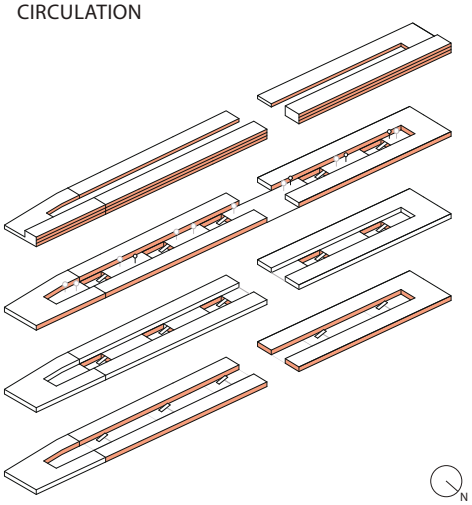
SOURCE: Full description extracted from:
http://housingplus.wikidot.com/barbican-london:case-study

I. General Strategy

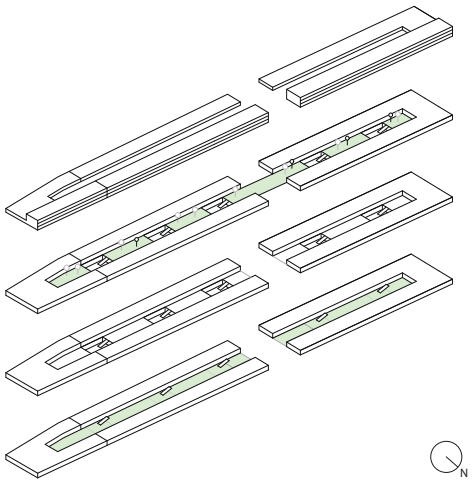
PROGRAM



CIRCULATION



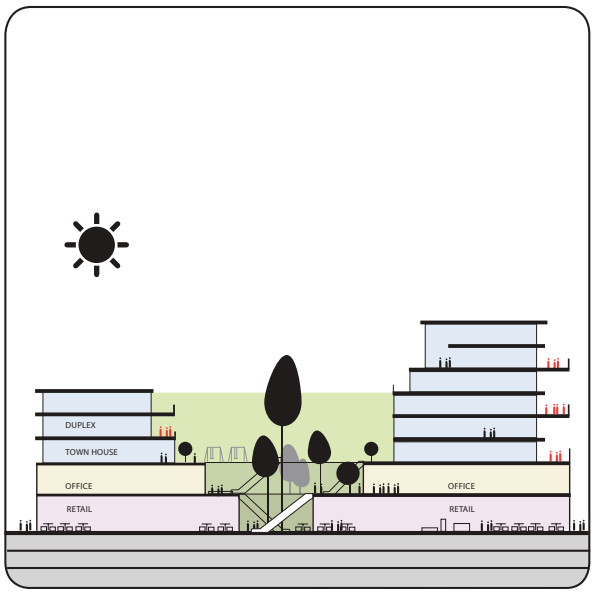
PUBLIC SPACES



Images: author diagrams.

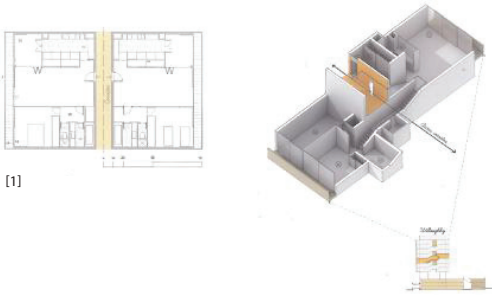
Instead of the program sectorization observed in the built project (and kept in the first strategy), we now propose a change in strategy in the sense of organizing the different programs in horizontal layers, overlapping trade, offices and housing, in ascending order. The logic of horizontal overlap compels a graphic representation of the volume in several layers and, ultimately, illustrates the multiple internal dynamics occurring at the different levels of the inner courtyard - which becomes a complex and interesting space – activating a dynamic form of living in the Big Building. Indeed, the programmatic multiplicity becomes visually present from any point of the building and, in this particular scheme, the direct connection of different points of the building becomes a possibility. In this strategy, it is somehow easy to imagine inhabitants, office workers and public users having coffee together at the low level courtyards of the restaurants; as much as it would be possible for an office worker to access his/her own house from the paths in the central landscaped courtyard. It is indeed this sort of interactions between uses that we intend to make possible. In that sense, links between the different floors of the patio and the different uses could be established through stairways or escalators.

It is also interesting to notice that the building acquires an ambivalent dynamic relationship, both with the urban space of the street and with the inner urban space of the building, allowing also for possibilities of interaction between the two at the ground level.



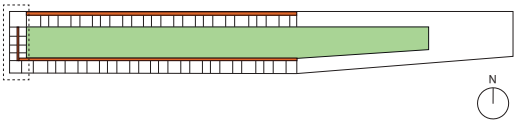
II. Housing

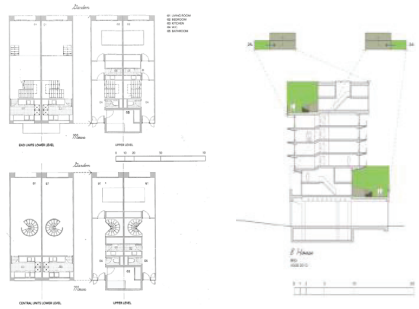
REFERENCE PROJECTS



[1]

[1] BARBICAN, CHAMBERLIN POWELL & BON (1955-83)
DOUBLE LOADED CORRIDOR
DOWN AND UNDER APARTMENT (UNITÉ D'HABITATION INSPIRED TYPOLOGY)

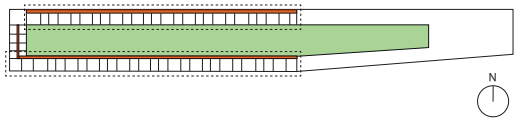


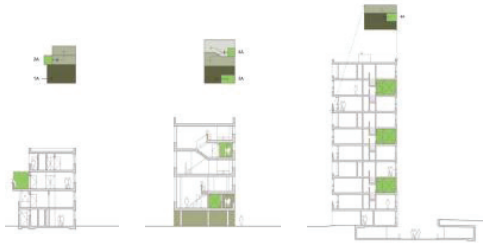


[2]

[3]

[2] BARBICAN, CHAMBERLIN POWELL & BON (1955-83) GARDEN FLATS
[3] 8 HOUSE, BIG (2008-10) GARDEN FLATS



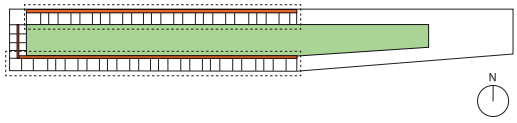


[4]

[5]

[6]

[4] JUSTUS VAN EFFEN COMPLEX, M. BRINKMAN (1919-22)
[5] NARKOMFIN DOM-KOMUNA, M. GINZBURG (1928-32)



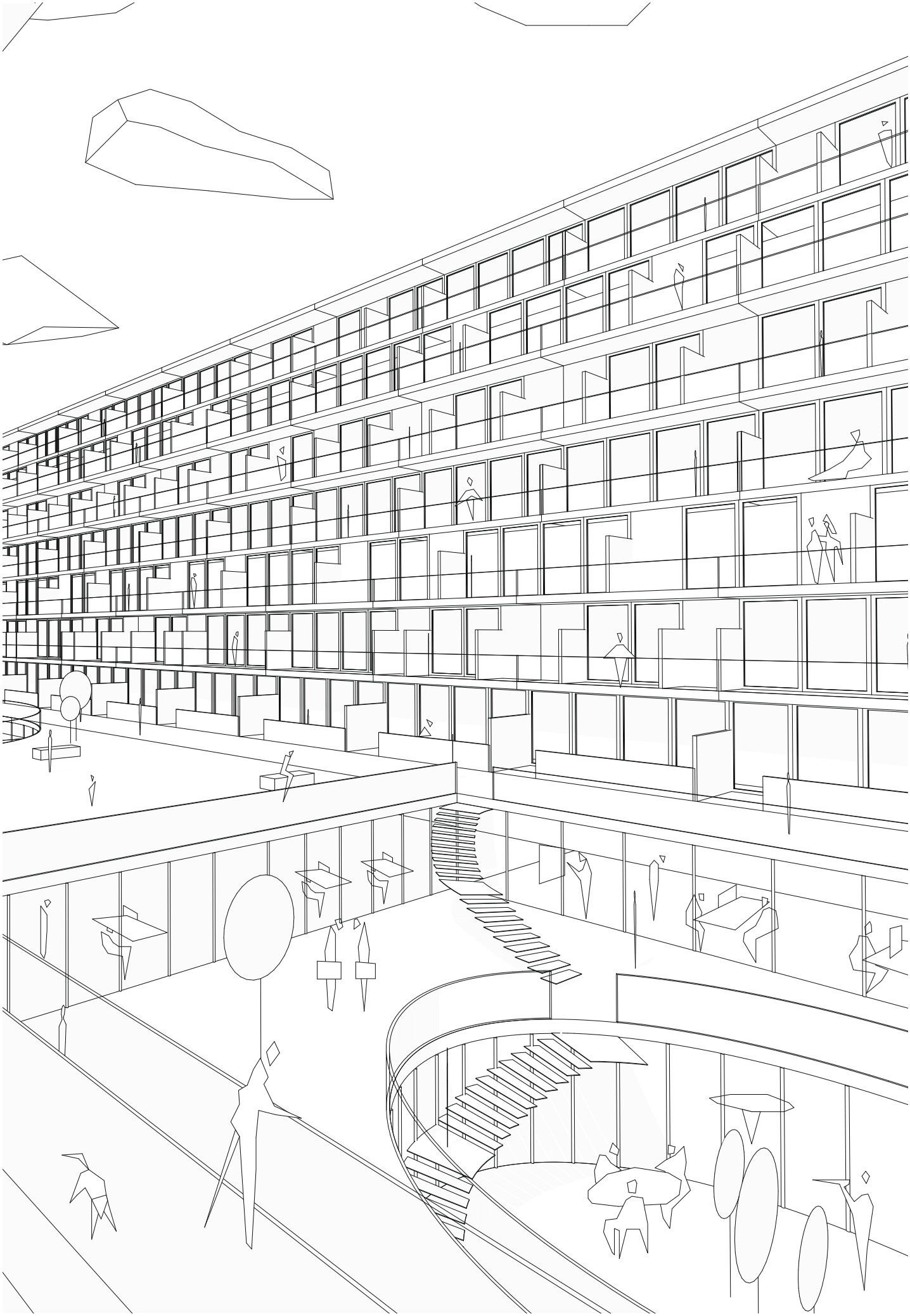
Drawing source: a+t, *10 Stories of collective housing*, 2013

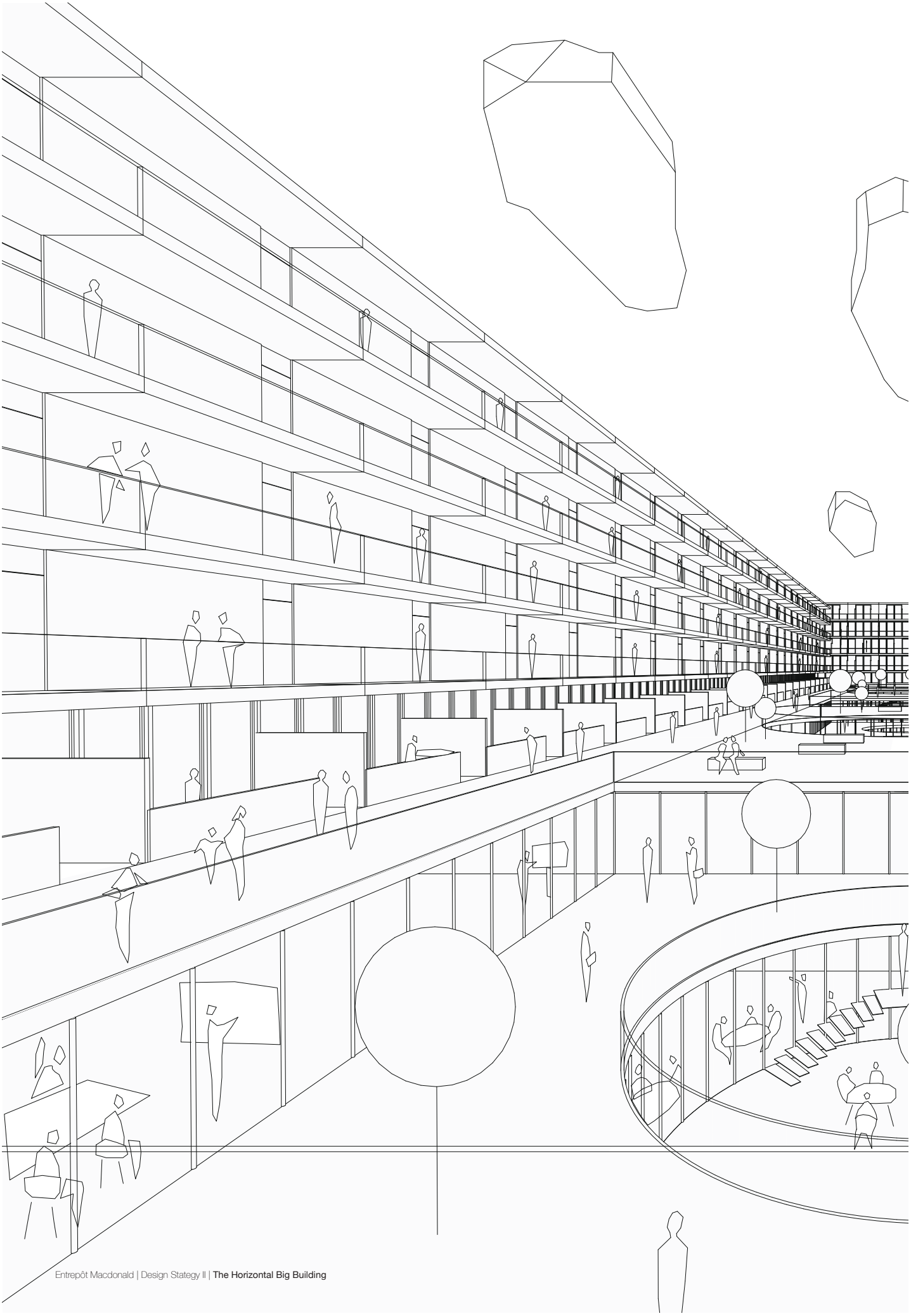
In this scheme, it would be possible to explore a diverse typological diversity - similar to the one of the Barbican estate - as well as to link the several different housing levels with circulation paths, passerelles and landscape zones. Moreover, it is fair to imagine that, from the inside of the apartments, it would be possible to have a general visual perception of life in the Big Building.

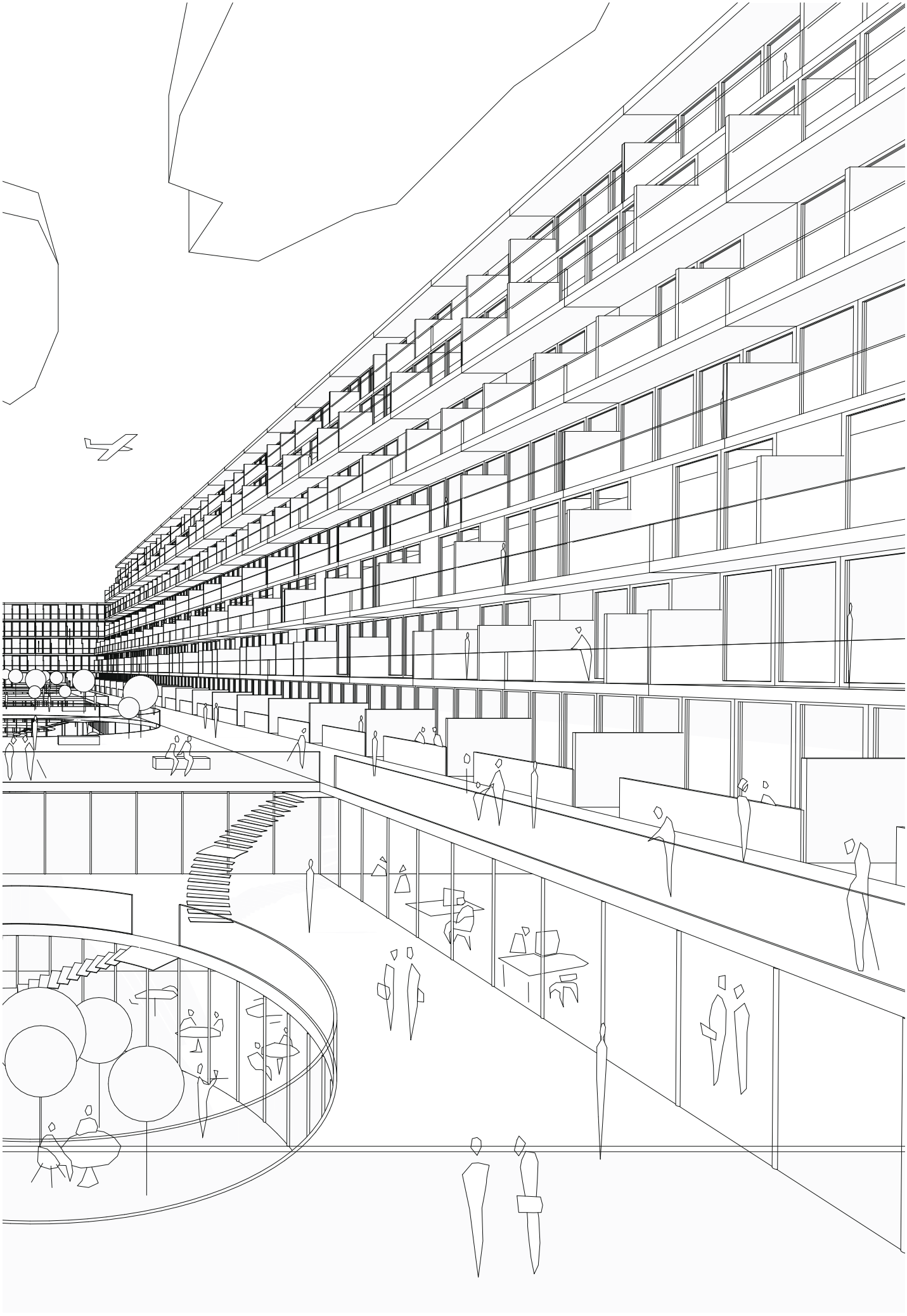
One of the housing typologies that could be added to this scheme would be the terraced houses, located at the first level of housing, on top of the office level floor, functioning as a visual break between the office area and the apartment area. These could be family houses with two to four bedrooms with a private green terrace outside that could possibly link directly to the communal courtyard.

Another Barbican typology that would be possible to integrate would be the access corridor typology, possibly at the housing block on the West, allowing for the integration of though apartments with views both over the square and the West and the inner courtyard. These could be alternated, in intermediary levels, with smaller apartments served through a double loaded corridor.

On the north-south façades, it would make sense to have gallery access apartments. In the examples of the Narkomfin and the Robin Hood Gardens or Pak Hill, the street is integrated into the façade, sheltered on three sides, which could contribute to provide a continuous regular image to the façade. In the earlier example of the Justus van Effen Complex, the gallery is seen as a distinct element which has been pierced onto the façade - a solution that could be interesting for the galleries towards the inner patio, for instance, reading more prominently as passerelles or 'streets in the air'. One could also imagine some punctual passerelles linking the two opposite wings of the project at higher levels, as way of generating a more articulated circulation system for the users.







Design Model III

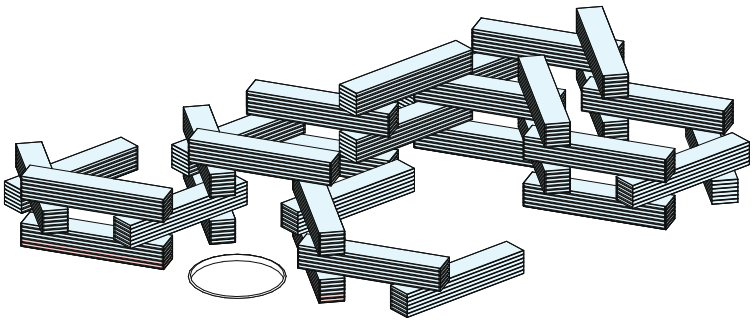
"The Compound Megastructure"

Case - Study III

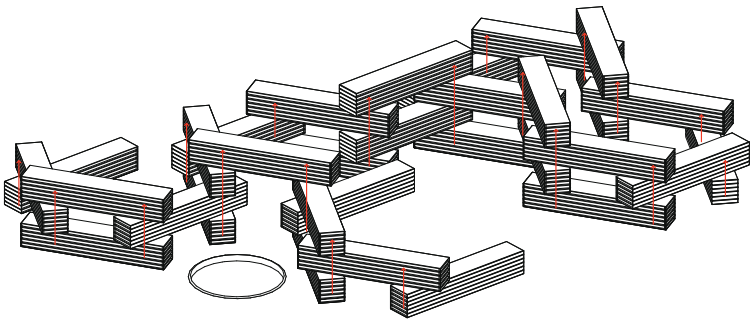
The Interlace

THE INTERLACE - EXISTING

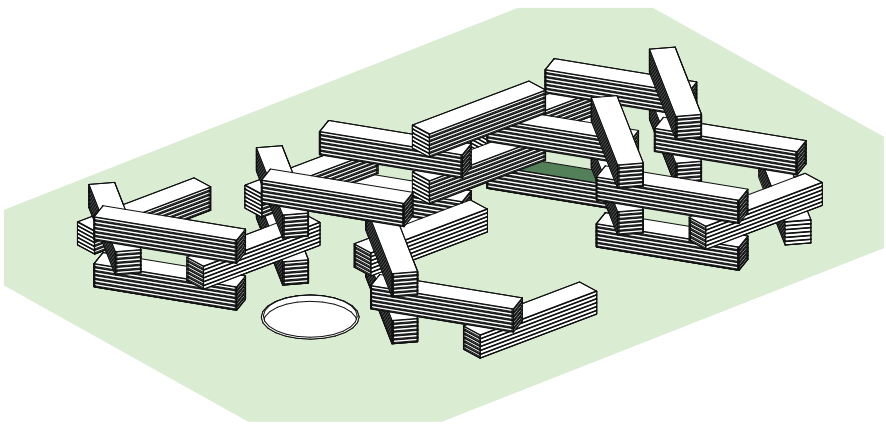
PROGRAM



CIRCULATION



PUBLIC SPACES



Images: author diagrams.

Case - Study III

The Interlace

Design Strategies

As we analysed this building in depth, we have acknowledged the thrill that this megastructural solution of 'housing in the Big Building' may epitomise, not only because of the intense dwelling diversity that it succeeds to accommodate within its 31 stacked blocks, but also for the comfort that is ensured by its base architectural scheme (although we believe it still bears some unexplored potentials).

The intricate scheme of blocks (with a 17m x 72m footprint) stacked around hexagonal courtyards (60m wide each) seems to enable a considerable number of advantages in regards to housing:
a) the blocks have a good depth for the planning of dwellings in terms of natural light and interior proportions - the majority being through apartments;
b) the hexagonal arrangement of the blocks allows for good natural light in the majority of the apartments, as well as for visual comfort in terms of setbacks (with reduced privacy issues), and yet it allows for permanent visual connections between the dwellings, and for the constant feeling of living in a 'vertical city';
c) the plan layout, with two cores per floor, alongside the minimized area occupied by circulation, ensures the efficiency of the plan;
d) the vertical staking and the hexagonal arrangement allow for the creation of multiple communal spaces, both at the ground level and at the numerous accessible rooftops;
e) the permeability of the scheme allows for a climatic comfort due to the constant air flow.

Nonetheless, some potentially interesting features seem to have been left unexplored:
a) the fundamental weakness of this building is the fact that it has been planed a gated housing complex and yet, from what we have analysed, the mix of different programs would have been simple to achieve;
b) although the circulation within the blocks is only vertical, some interesting horizontal logics would be explored considering the horizontal features of each block.

In the next pages, we will be exploring some soft alternatives to the built scheme that, we believe, could transform this building into a more complex and ravishing paradigm of housing in the Big Building.

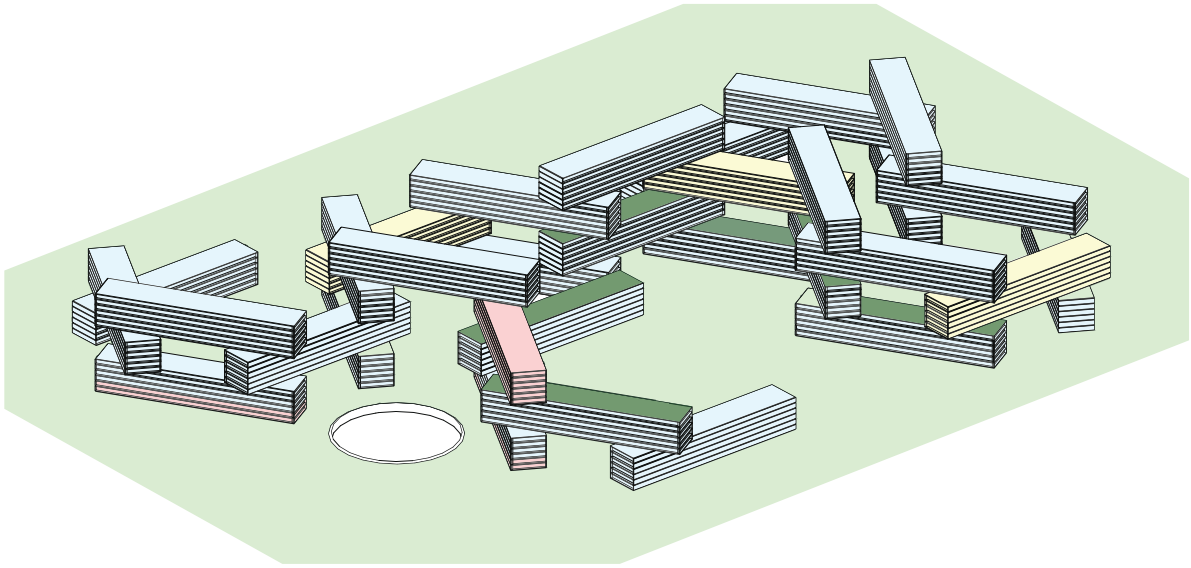


Image: author diagram.

The Interlace
(Soft) Design Strategy I

Step 1. **Integrating different functions within the base architectural scheme;**

Step 2. **Exploring new horizontal circulation axes, articulated both with the existing vertical circulation logics of the building and with the rooftop terraces.**

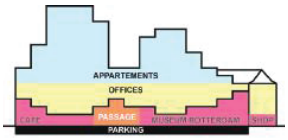
Considering the above described qualities of this building, mainly in what relates to the innovation of its housing scheme, our design approach to this project will be different from what has been developed for the first two case studies. In this case, we will restrain our design experiments to a single design strategy that will be more of a 'soft design', in which the basic architectural scheme will remain unchanged and only internal alternatives will be questioned and explored.

Our 'soft design' strategy will start by suggesting the exploration of a larger programmatic variety within the stacked block system - that could include offices, hotel, retail areas, equipments, etc. - and that would reinforce the urban pertinence of this building to the public realm, as well as its openness towards the city - undermining its current character of 'gated community'.

As for the housing, we will restrain our strategy to the suggestion of a housing layout that is not explored in this building: the double loaded internal corridor-street. This layout could not only be interesting as an addition to the housing variety contained within the scheme, but it could also add complexity and interest to the overall circulation system of the building, that would become more of a three-dimensional network.

This concept is illustrated in the graphic representations that we have produced for this strategy (to be found in the next pages).

REFERENCE PROJECT



TIMMERHUIS
OMA, ROTTERDAM, 2009-2015

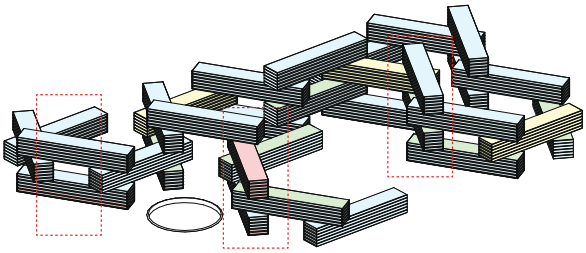
STATE:	BUILT
TOTAL AREA	45 000 m²
OFFICE	25 400 m²
RESIDENTIAL	12 000 m²
PARKING	3 900 m²
RETAIL	2 070 m²
MUSEUM / GALLERY	1 630 m²

For Rotterdam's Timmerhuis, a new building for the city hall that accommodates municipal services, offices, and residential units, OMA conceived a modular building with repeated units, gradually set back from the street as they rise into two irregular peaks, recalling, in many points, the unbuilt project Sky Village by MVRDV (2008).
Similarly to what can be observed in the above-mentioned project, the Timmerhuis's units can adapt to either office space or residential parameters as desired. Green terraces on higher levels provide the possibility of an apartment with a garden in the heart of urban Rotterdam. On the street level, the structure allows for generous open space, with modules overhanging rather than encroaching into an interstitial area, encouraging an active and open engagement between the Timmerhuis and the city.

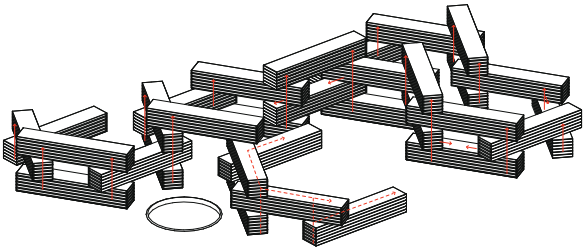
SOURCES: Full description extracted from: http://oma.eu/projects/timmerhuis

I. General Strategy

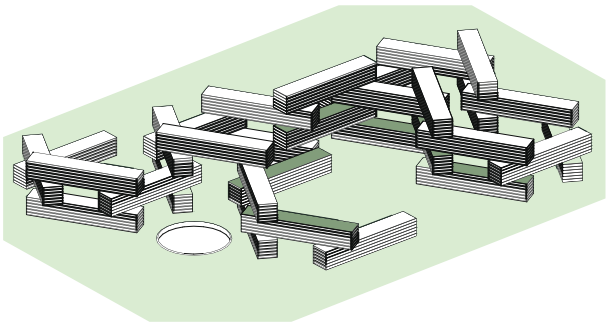
PROGRAM



CIRCULATION



PUBLIC SPACES

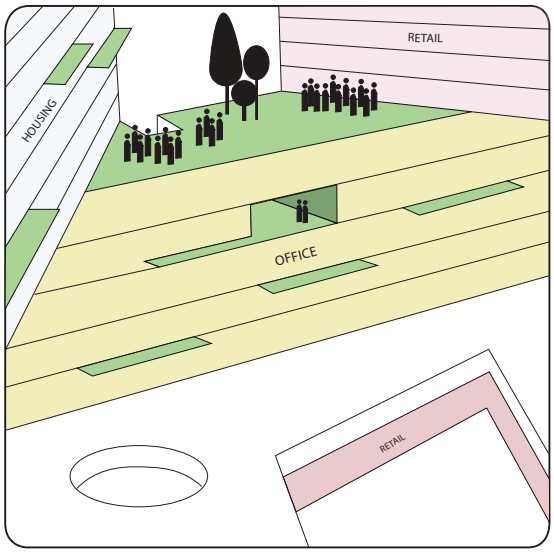


The concept explored in this soft design alternative maintains the configuration and size of the stacked blocks and switches the function assigned to each one of them, ranging from offices, hotel, trade, equipments and housing.

This strategy explores the functional mix in the points of concentration of the stacked blocks (see diagram) with intermediate elevated terraces (on the roofs of the volumes below). These could become meeting spots for the different users - recalling the true character of an urban square in a city.

This programmatic diversity could also contribute for the continuous animation of the building throughout the different times of the day: the offices and trade would guarantee the diurnal motion and the hotel, bars, restaurants and equipments would ensure the flow of users overnight.

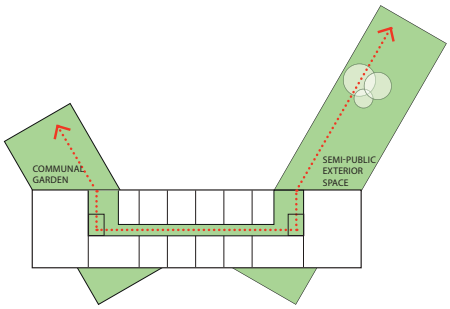
The functional diversity, associated with the plurality of intermediary spaces, located at varied heights within the building, may suggest the reproduction of a unique urban fabric arrayed along a three-dimensional spatial system – something that would be very particular to this volumetric scheme, as well as providing a unique living environment.

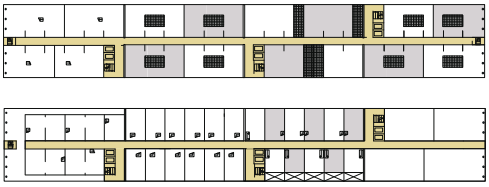


Images: author diagrams.

II. Housing

REFERENCE PROJECTS





SILODAM, MVRDV, FLOORPLANS 1:750

VMHOUSES, BIG, FLOORPLANS 1:750

POSSIBLE LAYOUT ALTERNATIVE

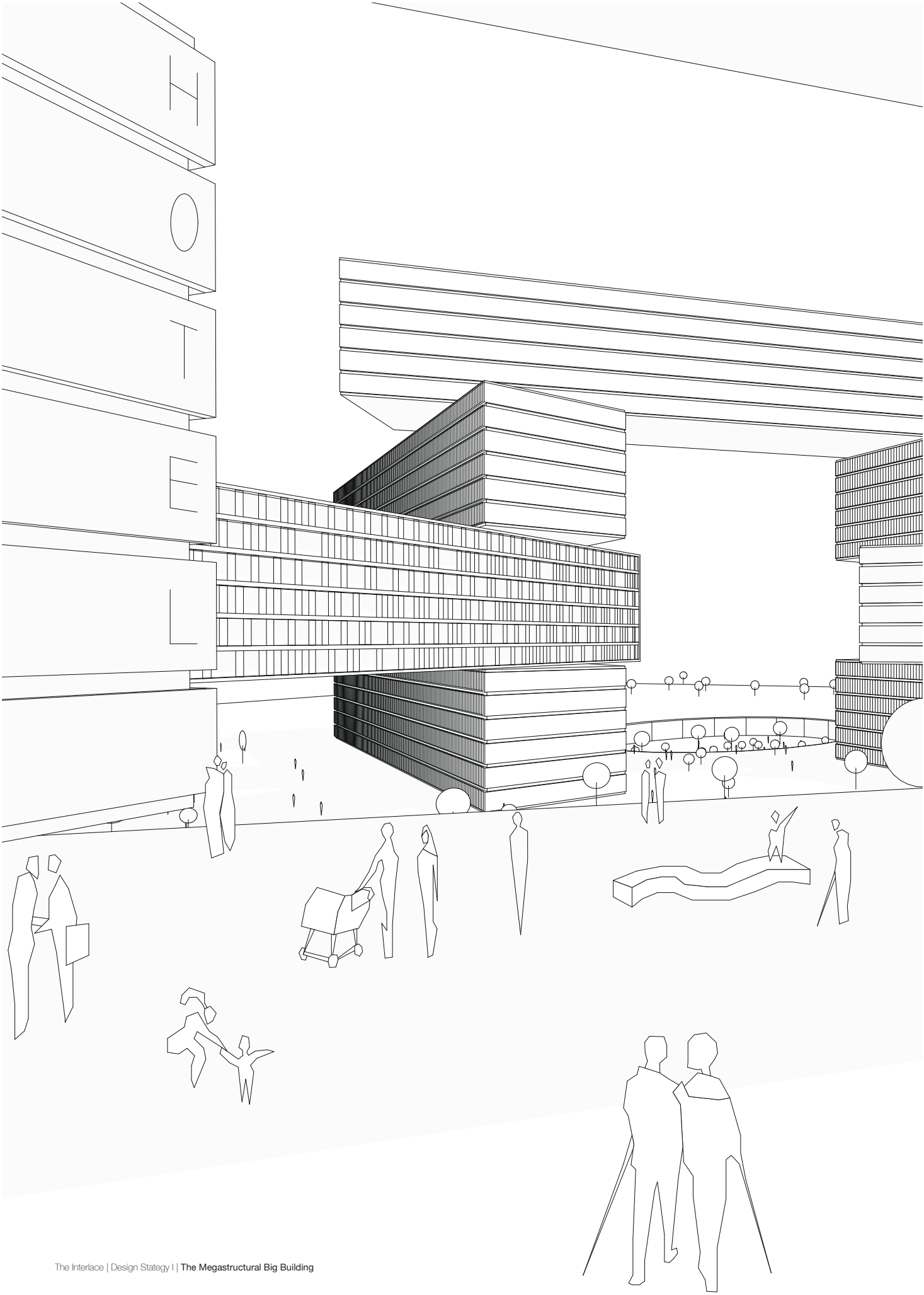
UNITÉ D'HABITATION INSPIRED TYPOLOGY

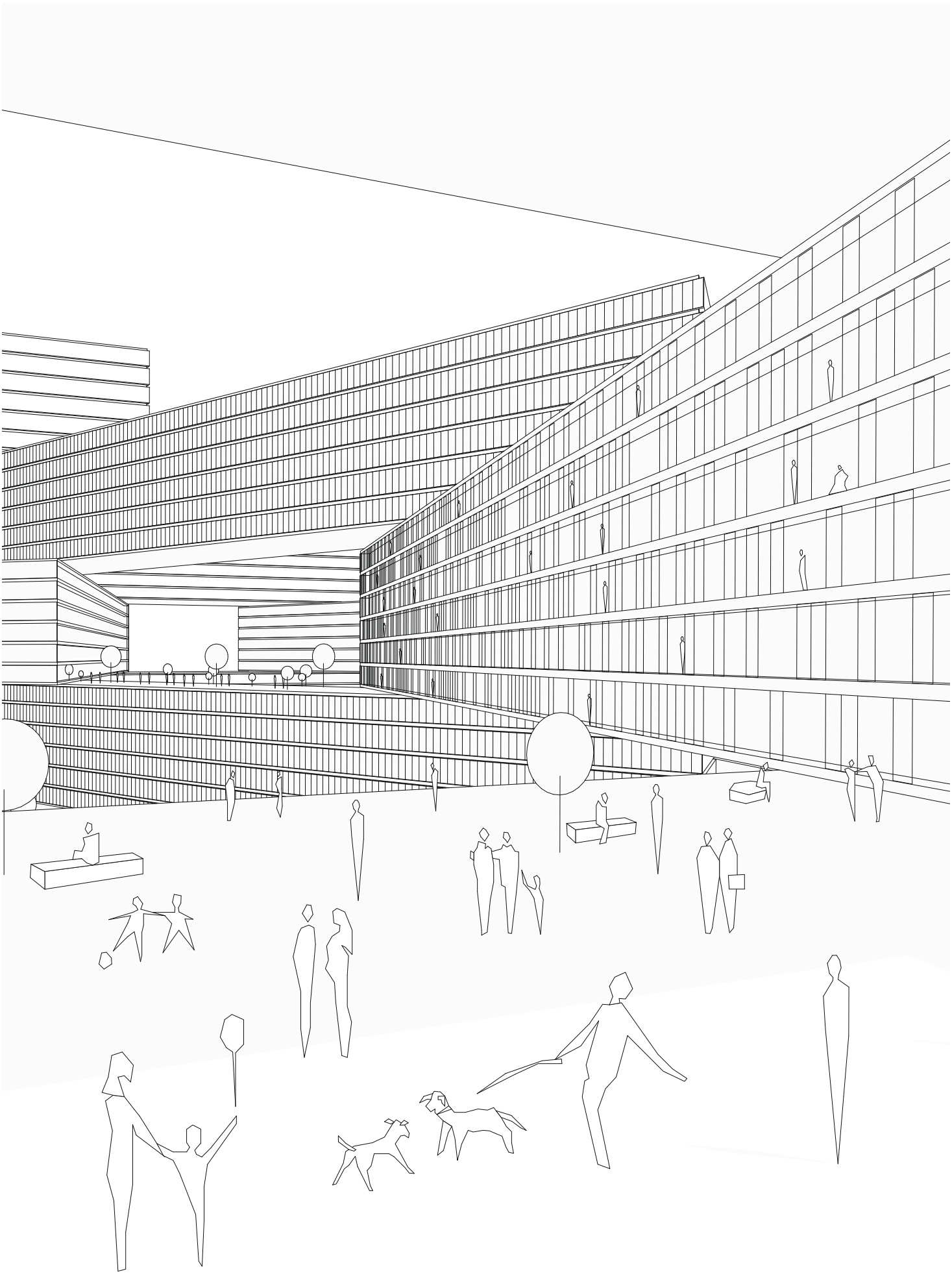
In regards to the housing solution, two main alternatives could be explored within this block-stacking scheme:

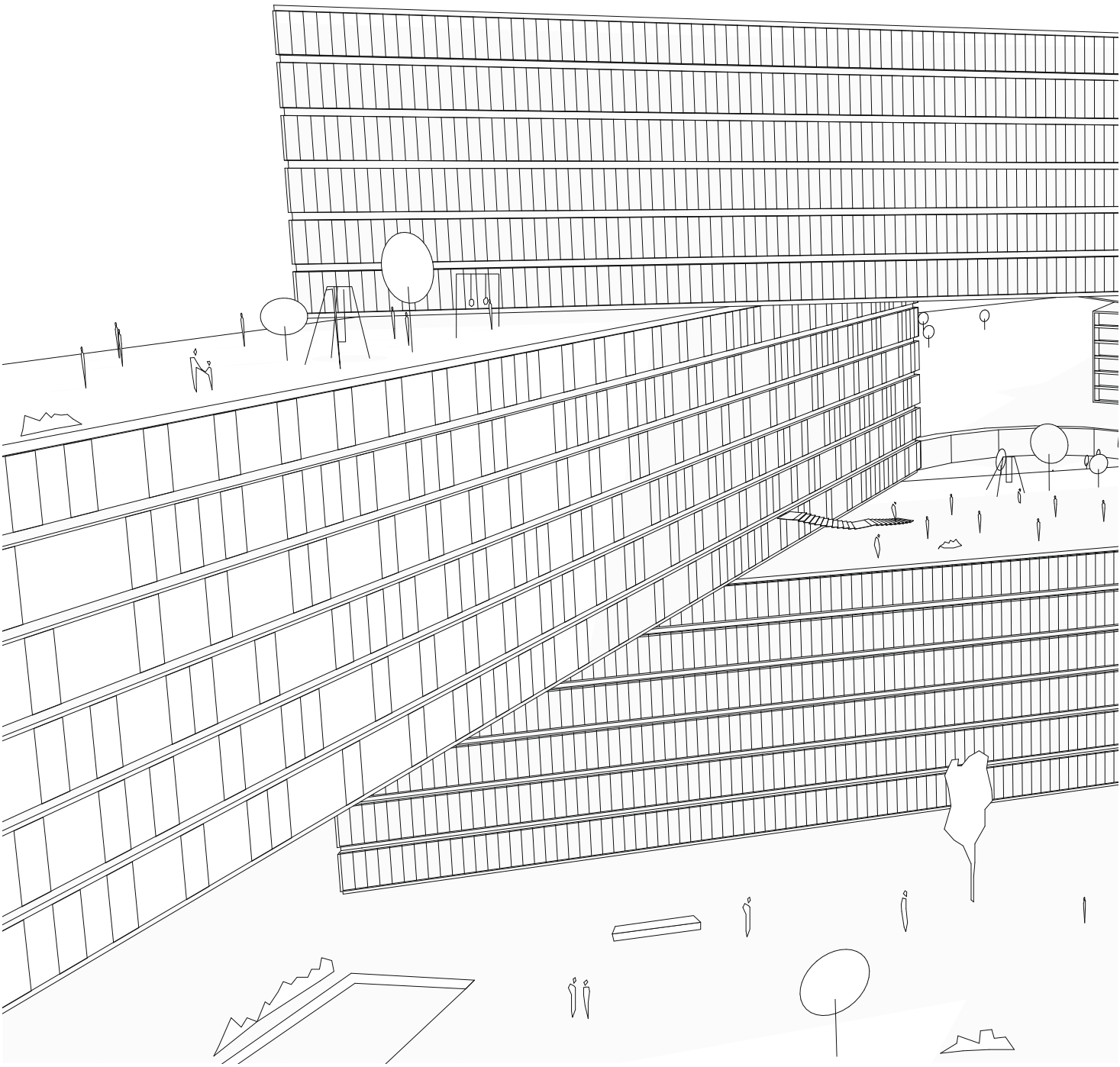
a) The horizontal shape of each housing block would allow for the creation of interior circulation galleries/'internal streets', and ultimately these could allow access to the rooftops on each side. This gesture would enhance the dynamics of the building as an intricate, multi-dimensional and articulated system, just as what the overall image of the building may a priori suggest. Simultaneously, new typologies of duplex apartments could be added to the scheme, further increasing the typological variety of the ensemble.

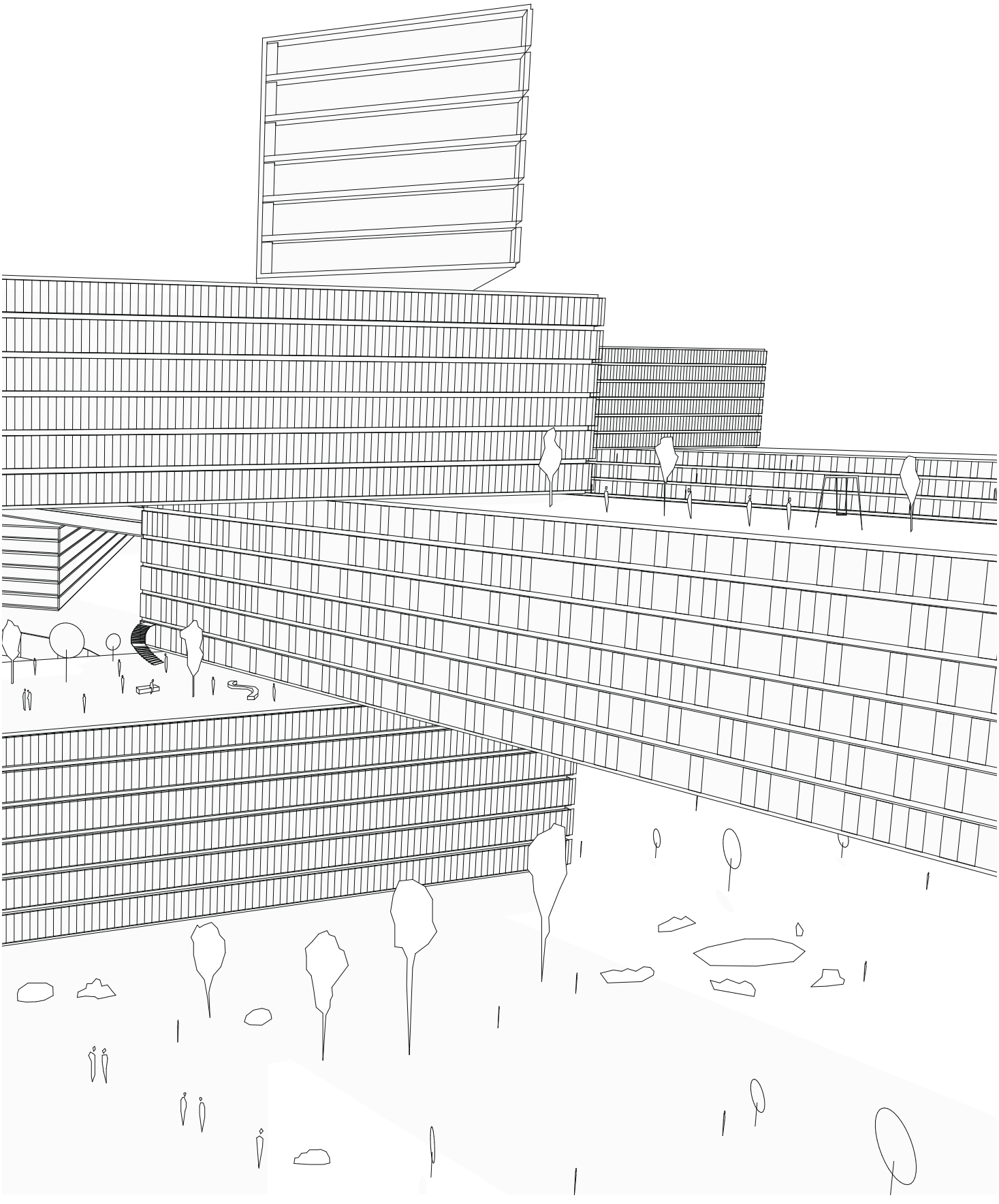
b) Each block could be planed for a specific social group (from young couples, to families, elder people, social housing, etc.); each block could represent a small community. The access systems and smaller communal areas at the terraces could respond specifically to the needs of each group, whereas larger communal areas for the ensemble of the inhabitants of the complex (and/or public users) would still be provided.

This neighbourhood concept we are referring to is somehow comparable to the one explored in MVRDV's Silodam in Amsterdam (although the depth of the blocks is slightly bigger: approximately 20m). At the Silodam, these interior galleries allow access to duplex apartments at the lower levels and to patio apartments and penthouses at the upper levels. Declaredly inspired in Le Corbusier's Unité d'Habitation, the plan of the VM houses project by BIG in Copenhagen - an example of extreme exploration in terms of typological variety [see chapter 3] - could be an equally relevant reference of gallery access that could eventually inform the design of the Interlace.


HOTEL







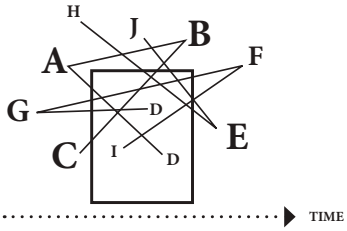
Concluding notes

How does the conception of the Big Building – a large multifunctional container - trigger new practices and innovation on today's architectural/urban production? And how can this particular model of hyper-density become the base environment for the generation of innovative and thrilling new forms of collective housing for the greatest number?

These have been the two fundamental questions that we have raised at the early start of our research – implicit in the title of the research itself - and these are also, at this point, the two main questions that we need to address in order to duly conclude our study of this particular form of complexity, related to the articulation of two radically different scales of architecture: the Big Building and the dwelling unit.

Our extensive analysis of the Big Building has been guided by four fundamental hypotheses/objectives that correspond to four different moments on the development of our research. In a first moment, we have tried to understand the general theoretical concept of *complexity* in the domains of architecture and urbanism; we have departed from a general approach and proceeded then with an approach that is closely linked to the conception of the Big Building, bearing in mind its design process and its operational/constructive process. In a second moment, we have tried to understand the real potentials of the Big Building – mainly the ones that derive from its typical condition of hyper-density and mix – the articulation of different uses within one container and the articulation between the container and the public space. This research has been nurtured by the analysis of a series of historical and recent case-studies that tackled the evolution of a seminal mixed model into what is today's Big Building - looking specifically at conditions such as the relation of the building with the city, the inclusion/non-inclusion of public space, the articulation between different uses through intermediary spaces, the general housing scheme, the integration of housing in a mixed functional system, the inclusion of parking and the articulation between building and city. In a third moment, we have looked particularly into the conditions of housing in the Big Building, namely the importance of the collective circulation and articulation of spaces on the definition of a thrilling living environment, as well as the potential conditions of typological and social mix to be found and/or explored within such large scale devices. Finally, in a fourth moment, we have looked specifically into three core case-studies that might embody exemplary base Big Building models – each bearing a different formal strategy - that may elucidate specific difficulties and potentials (namely in terms of vertical/horizontal circulations and the inclusion of in-between spaces). Along with the extensive theoretical analysis that has initially been developed, a more practical approach to these three case-studies has been the base for the development of some strategic design experiments, which have, on their turn, informed our conclusive set of guidelines, which is aimed at assisting the conception of the Big Building.

The present conclusion will recapture the initial objectives and hypotheses of our research in order to help us structuring our fundamental findings and ending guidelines.



1. Complexity and the Big Building

Architectural complexity versus procedural complexity – is the Big Building an opportunity to introduce a new theoretical approach to the concept of *design complexity*?

One of our initial aims was to understand the overall idea of *Complexity* that was behind the conception of the Big Building. Our research has begun with the analysis of two fundamental moments of the theory of architecture that have explored the subject of large-scale and complexity. The first moment dates from the 1950-60s and is led by Alison & Peter Smithson and the Team X. It arises with the aim of reintroducing a humanistic form of architectural/urban complexity, in opposition to the modernist models of large scale and the segregationist principles of the *Charte d 'Athènes*. This 'desirable complexity' is linked to the revival of key elements of the city and the restoration of the implicit relational complexity of the traditional urban fabric - this approach focused on transposing to the design of residential buildings (which tended to follow an orthogonal hygienist logic) the relational complexity of urban environments, especially the one of the street. The second moment, headed by Rem Koolhaas, dates from the 1990s and it refers to the rupture of *scale* – Bigness – as a starting point for a new type of architecture – one that is so complex in its formulation that a single architect can no longer resolve it. Koolhaas focuses more on the process (and its multiple divergent actors) than on the defiant design challenge which is that of conceiving and designing complexity within a building of exceptional scale and shape - and still manage to articulate it with its context. Moreover, Koolhaas refers to Bigness as a building model that exists on its own and that hardly relates to the city.

Almost no lines, in his extensive writings allow us to acquaint with the inner complexity of the Big Building – as if the architect had surrendered to the supremacy of the speculative external forces. Does the procedural complexity really imply giving up on a 'desired' form of complexity within density? This ambiguity has led us select a set of built examples of Big Buildings (old and new) in order to enlighten our understanding around this hypothesis. In a first moment we tried to understand why these two approaches to scale-and-complexity were so radically different. In a second moment, we launched the hypothesis that a new form of complexity (a desired relational complexity – while still dealing with the implicit complexity of the process) can potentially be attained. Can we still aim to develop interesting mixed functional schemes and mixed housing schemes within the Big

Building? Shall we take for granted that the Big Building can hardly articulate with any urban context?

As we moved deeper on our research, we understood that the examples of Big Buildings containing a thrilling architectural complexity were a minority and that it was often the complexity of the process – the conflict between multiple diverging interests – that led to a simplification of the design. The relational complexity one would expect to find inside the Big Building is often supplanted by the real political and economical conditions involved in the production of the most of these models around the world.

We have understood that the current production of Big Buildings is intrinsically linked to speculative models and to global and territorial forces, and although most of the times these buildings are designed by renowned architects, it turns out that its design is dictated more strongly by economic interests than by architectural or social ideologies.

Through the in-depth analysis of our case studies, we have acknowledged that the role of the architect as the key entity defining the design has been weakened, even if often the architects are renown and influent. In most cases, the architect becomes more a coordinator of the many different entities than the actual person defining the design strategies.

Indeed, the main weaknesses that we have identified in our three main case studies have to do more with the process than with a pure design process: at De Rotterdam, the functions ended up being accommodated within separate towers above the podium; at the Entrepôt Macdonald, for the sake of clarity and ownership, the program ended up being organized by sectors and the overall result is a juxtaposition of many small buildings; at the Interlace, the scheme ended up being monofunctional and speculative – a housing condo – despite the potential of its architectural volume.

Bearing this observation in mind, our hypotheses have been formulated under the form of design strategies that depart from the design of the built case studies and throw a series of alternative strategies that could embody a ravishing form of architectural complexity regardless of the complexity of the process. Our research focuses indeed on the gap that lies between the two approaches. We will, above all, raise the hypothesis that despite the intrinsic complexity associated to the conception of Big Buildings (extra-large built envelopes hosting a large variety of programs including housing), it is still possible to conceive housing schemes with architectural quality and social significance. Through our analytical and design strategies, we have tried to investigate whether the constraints linked to the challenges of conceiving *a city within a building* can result on innovative and interesting schemes, mainly in what relates to the subject of habitat.

2. Program mix, urbanity and the Big Building

We have initially raised the hypothesis that the articulation of different functions within a Big Building differs from the one normally developed in urban planning and also in architectural buildings, raising new design challenges related to functional mix. Our initial aim was to understand the potentials of articulating multiple sorts of programs with housing, as well as understanding the Big Building as an innovative multifunctional device articulated with the city - an opportunity for the city to grow within borders, avoiding the urban sprawl.

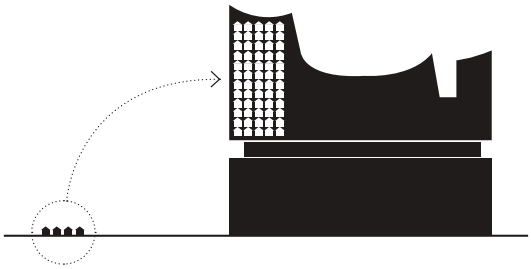
Among its fundamental features, the Big Building embodies an accumulation of different programs, each carrying specific conditions and requirements. We have therefore raised the hypothesis that the exercise of gathering several different programs of a city within a building implies complex and innovative design challenges, focused mainly on the in-between spaces and on the intermediary scales that consolidate the largeness of the envelope with the smallness of some functions, namely the dwelling unit.

Indeed, the strategies applied to the design of programs with opposed levels of privacy (for instance, housing and public equipments, housing and offices) imply a particular effort on the conception of the transition/articulation spaces, not only in their spatial qualities but also in the provision of adequate services to ensure comfort, suitable socio-functional and spatial responses, privacy and security, accessibility and innovative types of indoor conditions. Moreover, the traditional elements of the urban planning – the building, the street, the plaza, the courtyard – are subjected to reinterpretation in the planning of a Big Building, transferring to the category of architectural/urban spaces, and keeping their qualities as complex generators of urban life inside a building.

Throughout our analysis, we have done an effort in the sense of understanding the functional organogram of each building, the logics of circulation and articulation within it, as if we were staring at the map of a city. We intended to verify how the very different levels of publicity and privacy have been resolved, the potential of the in-between spaces and the responses that have been given to the challenging security issues. Finally, we looked in detail at housing, the access paths, the intermediary access areas, the apartment sizes and types, verifying whether typological or social mix have been considered as design premises.

However, as we analysed our selected range of Big Buildings, we have understood that the conciliation of multiple uses rarely responded to this effort of interaction, and that the Big Building is often resolved through simplistic methods: different programs are planed aside without necessarily correlating or sharing any sort of intensities. This has possibly to do with the fact that the fundamental issues related to megastructures in the past were linked to the co-property condition on shared spaces – the maintenance responsibility/costs assigned to multiple people, the difficulties of refurbishment and the possible difficulties associated to selling a part of the building since as it was intrinsically contained within a mass. We have seen that, at De Rotterdam, the design strategy has set the different programs within independent towers on top of a common podium, allowing for a clearer co-property scheme; we have also seen that at the Entrepôt Macdonald, the program has been divided horizontally into different sectors, which means that an apartment building can be 500 m distant from a school and reached only through the contiguous street, having, in the end, little to do with the concept of functional mixed within a container. At the Interlace, although there's articulation between the different common areas, the functional diversity is very low and therefore one cannot really talk about functional correlation or the issues that may derive from such condition.

What we can observe in these Big Buildings is the lack of a sense of articulation, circulation and fluxes that are the fundamental principles of any urban environment. Nonetheless, we can also state that such observation isn't linked to any sort of architectural impossibility, but rather to external factors that have to do with the process. There are indeed some examples where the idea of articulation between uses and the grafting with the city is done exemplarity. We have highlighted Steven Holl's Linked Hybrid, for its cleverness on occupying a site with a typology that not only allows for the planning of high quality housing (with slender floor plans), but it also manages to create an elevated street containing public uses and linking all the housing areas, and hence creating a truly articulated, spatially complex system. It introduces the concept of 'sky-bridges': elevated passerelles that are filled with cultural and public programs. At the same time, this building creates a strong bond with the city at the ground floor, through the reinforcement of commercial uses and through the landscape design of an inner 'courtyard-plaza' that is porous and articulates with the surrounding urban context through a network of passageways that are accessible to everyone. Besides bearing evidence for the possibility of a successful articulation between uses, this building (with an exceptional area of 221'500 m^2) proves that, regardless of the exceptional size or 'strangeness' of the building's architectural envelope, it is conceivable and desirable to develop strategies towards the articulation with the urban fabric. Similar qualities have been observed at the 8 Tallet building, by BIG, where a continuous paved street connects the landscaped ground level of the building to its upper levels, providing access to the successive terraced houses and allowing users to bike along the entire path. This 'architectural street' seems to bear the character of an urban pedestrian street, yet cleverly planned within a dense architectural scheme.



3. Housing and the Big Building

We have initially raised the hypothesis that the planning of housing within the exceptional context of the Big Building would automatically trigger innovative solutions of collective housing and its related features such as density, hybridity and mix. However, throughout our analysis, we found out that not only this innovation wasn't a direct consequence of the condition of functional mix contained within the Big Building, but we've also understood that the housing typologies may become repetitive, simplistic and bear doubtable quality due to external factors such as financial pressures.

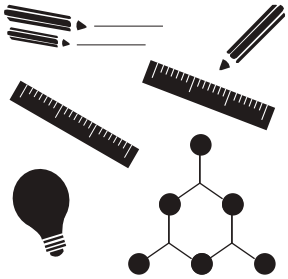
The query of housing in the Big Building starts in the previous point: there is no real link between the spaces, the feeling of inhabiting a building-city gets lost and housing eventually acquires a conventional character. The truth is that the path between the street and the front door is rather basic and conventional: a sequence of parking - lift - distribution corridor - home door; or else entrance lobby - elevator - distribution corridor - home door. This situation occurs in our three fundamental case-studies; even the Interlace, that would a priori provide interesting paths between the entrance in the complex and the arrival at the apartment door, ends up having a conventional access system as well, since the vast majority of the inhabitants (given the remote location of the complex) will be made by car and from the car park, with direct connection to the elevator that links to the housing floor.

Moreover, it appears that the types envisaged for these buildings are dictated primarily by economic and financial logics and by speculative dictums. The housing program is not exempt from these economic pressures that often force space reduction towards more efficient floor-area ratios. This problem is particularly identifiable in the building De Rotterdam, in which the apartments are small and bear unbalanced proportions, seemingly resulting from a clear attempt to attain the maximum space exploitation; as a consequence, the building does not match the high standard category it aims to correspond to, and it actually does in terms of selling costs. A similar problem is reported by the multiple architected involved in the planning of the Entrepôt Macdonald, especially in the categories of buildings for sale (curiously more than in the social housing dwellings) – as the pressure from investors to accommodate the largest number of apartments in the smallest possible area limits substantially the freedom of the architects. The apartments become too small and the typologies become dull in an attempt to circumvent the problem

of the few distances between façades and the feeble exposure to natural light – a problem that is enhances by the majority of its multiple conceptors. The Interlace surely is the example in which the housing typologies are worked more carefully, with greater diversity and greater comfort levels of lighting, views and distances; this is probably because this building - hosting mainly housing and having been financed exclusively by a private investor – seems to have been attributed greater autonomy on the design exploration and suffers less from the pressures of multiple investors than the first two examples.

At the same time, we end up deducing that, among the Big Buildings that contain housing, the housing program ends up not receiving a particular thoughtfulness, and especially not presenting the base qualities that we initially expected to find: an interesting interaction between housing and other programs. However, when we opened our study range to buildings of smaller scale (about half of the proposed in our initial threshold of 100'000 m^2), we realize that there is space for creating more complex facilities construction and further exploration to theme typological mix, as well as the transition areas; however, these examples are always more limited as regards the functional mix. This may be related to logics that are directly associated with the scale and less pressure from investors, allowing for a greater creative freedom of the architects.

Although we have identified such qualities of *mix* in some Big Buildings - we have highlighted for instance the housing qualities and the typological variety of the Barbican or BIG's 8 Tallet - we have also noticed that, from a certain threshold size, the larger the scale, the more typified the housing production becomes. We have also stated that for several examples of Big Buildings, mainly when the development is planned vertically, the housing production is often restrained to luxurious schemes. Though we were initially expecting that such particular condition of functional and social mix, and largeness would automatically generate new thrilling logics in terms of housing – and mainly on what it would represent to inhabit such exceptional devices – we have realized that the reality of housing in the Big Building was rather inversely proportional to the scale and expected complexity of the Big Building. This may mean that the higher the scale, the functional diversity and the complexity of the process, the higher the more simplistic and repetitive the housing plans may become. This condition has several reasons at its base but, more recurrently, they are linked to the supremacy of the will of the developers and to the fact that housing is often the primordial program to get benefit from financial return. In that sense, the designers are instigated to work on the overall architectural look of the building, leaving behind the exploration of the small scale, which is the one of the dwelling – the architectural work on the Big Building remains most of the times focused on ensuring the functioning of the global device. This observation has forced us to seek buildings of smaller - namely some projects of MVRDV, such as the Silodam, El Mirador, Celosia, Parkrand - to help us illustrate the type of mix and innovation we were initially expecting to find and explore inside the Big Building – and that have more actively nurtured the set of guidelines that we will list in the next pages.



4. Complex Design, the Big Building and Design Guidelines - A System of Interconnected Parts -

We have raised the hypothesis that the Big Building is a new model of complexity – in between Architecture and Urbanism – requiring its own specific tools. This hypothesis has been confirmed as we dove deeper on the analysis of our selected case studies. Due to its exceptional character and dimensions, the Big Building forces the creation of several hybrid models – in between the normal tools of architecture and urbanism - in its multiple related fields: from ownership (a wide range of different owners and users are involved), to economy (with the recurrent creation of public-private partnerships), to law (special contracts are often elaborated in order to adapt the normal building regulations to the particular conditions of the Big Building). Our focus, though, remains centred on the analysis of the hybrid effects that can be observed within the process of the Big Building's design conception. This applies simultaneously to the normative parameters and to the specific conceptual approaches exploring a certain range of design elements that become hybrids between the two disciplines (often denounced by terms like the 'corridor-street', the 'landscape courtyard', the 'sky-plaza', etc.).

We have analysed some examples where the practical normative issue was clearly identifiable, one of the clearest ones being the Entrepôt Macdonald, whose volume – in terms of heights, distances and setbacks - has been determined by urban rules whereas the interior of the housing buildings has been designed according to the existing building code. We have also observed that, for the majority of the Big Buildings - mainly the high-rise models - the standard building code no longer applies and thus exceptional rules and contracts have to be established in order to enable the construction of these buildings.

Simultaneously, we have observed that, since the construction of Le Corbusier's *Unité d'Habitation* in the 1950s and the intensified production of high-density housing schemes, the design strategy that focuses on replicating urban elements and urban circulation logics within large-scale architectural containers has been repeated and reinterpreted several times by other architects (see, for instance, the examples of Mat Buildings, the projects of Alison and Peter Smithson or the numerous recent realizations of MVRDV or BIG, amidst other). Indeed, if we recall the seminal theories developed by Le Corbusier or Alison and Peter Smithson, or even the urban theories conceived by Jane Jacobs or Christopher Alexander, we

understand that what informs the design of the Big Building is the complexity that is intrinsically linked to any urban environment – namely the vernacular 'street-house relationship'.

This form of complexity has to do first with the overall idea of a system of interconnected parts that conciliates the functional diversity, the social mix, the public spaces, the shared uses and activities, the visual connection, the ideas of publicity and privacy, amidst other. The Big Building shall therefore aspire to recreate the thrill of the urban complexity inside a massive and dense container.

Keeping in mind this aim of recreating a thrilling urban complexity (that we have identified in some Big Building schemes, such as the Barbican, the 8 Tallet or Steven Holl's Linked Hybrid), we have understood that some specific design strategies can be applied to the design of Big Buildings, helping to trigger interesting interchange between programs, and also to activate a sense of community-life amidst the inhabitants. The particular challenge that we have tackled is the one that pursues the conciliation of two extreme architectural scales: the small domestic scale of the dwelling and the 'urban' scale of the Big Building. Working on what is 'in between' may be crucial in order to generate an interesting living environment. In that sense, we have understood that working on intermediary design scales may be the key for attaining successful living models inside the Big Buildings, that will ideally become innovative and ravishing new places to live at the heart of the city.

As a form of synthesizing the thoughts we have collected from the ensemble of our analyses, we have established a series of parameters that, from our point of view, may bear important guidelines on what relates to the design and conception of quality living environments, as well as successful functional articulations within the Big Building. We have started from the most generic observations and moved into more specific/chirurgical observations.

4.1. Different volumetric models

One of the fundamental characteristics of the Big Building is the fact that it is a massive container, an enclosed object holding an extensive and complex number of programs and events that are generally not perceived from the outside – with the façade acting as a disinformation agent towards the interior (one of the basic characteristics of the Big Buildings listed in Rem Koolhaas's manifest).

One thing we have observed through our analysis is that, departing from a similar size and equivalent functional diversity, the shape of the building and its configuration/circulation system (vertical, horizontal or compound) may raise different issues and potentials - ultimately calling for different strategies that again merge the subjects and tools of architecture and urbanism. Amidst the several types of Big Buildings that we have analysed - and mainly departing from our three core case studies - we have identified three groups of shapes. For each shape, the strategies to be applied towards the achievement of the fundamental purpose described above – 'a system of articulated parts' - may suffer slight variations.

Type I - The 'Vertical City' – a multifunctional container inside which uses are stacked vertically and connected mostly through vertical circulation axes, via elevators. Among other buildings, we have analysed the example of De Rotterdam and a few possible design alternatives. Though the idea of reproducing a sort of 'urban network' deployed vertically within a building has inspired several projects, the vertical shape implies a difficulty that has been enhanced by Koolhaas in *Delirious New York*, as the elevator generates schism between floors and reduces the chances for fluxes and 'urban' events within the building.

Type II - The horizontal 'City within the City' – a horizontal multifunctional building that allows for simultaneous horizontal functional layers and programmatic juxtaposition, and inside which uses are connected through horizontal and vertical paths. Amidst other case-studies, we have looked in particular at the example of the Entrepôt Macdonald. Although this building would a priori have a much higher potential in terms of a possible proliferation of urban events (if we think of the Mat Buildings, the projects of the Team X or Le Corbusier) these haven't been observed in our constructed case-study, yet we have identified this potential in other buildings like the Barbican or the 8 Tallet. Through these analyses, we have understood that there would be the potential for the development of an articulated system of different uses, with different levels, different dwelling typologies and interesting physical and visual interactions at the Entrepôt Macdonald, and we have suggested the implementation of those principles in our design strategies.

Type III - The 'Compound Megastructure' – a multifunctional container structured by a network of simultaneous horizontal and vertical axes and corresponding articulation logics, recalling the megastructures of the 1960-70s. This model has been tackled mainly through the analysis of The Interlace – a complex amalgamate of superposed housing blocks. This multidirectional hybrid form allows for simultaneous vertical and horizontal circulation axes (though the horizontal ones have little expression in the built scheme), as well as for an interesting integration of gardens and common terraces/squares implemented at the rooftop levels - still urban and exterior, and yet integrated within the circulation system of the building – resulting on a thought-provoking intertwine of housing, urbanity and nature.

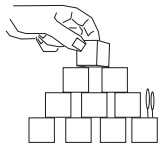
4.2. Dealing with Density - 'breaking the mass'

As buildings become larger, deeper and denser – often occupying one or more city blocks - it becomes imperative to find strategies to build quality spaces within the massiveness and the compactness of the volume. This issue is particularly complex when the program to be included within the volume is housing, as it is intrinsically subdivided in multiple small units – the dwelling units - and, additionally, the right levels of light, ventilation, privacy, security and view have to be ensured to each unitary element.

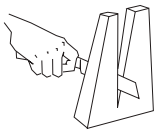
We have observed, indeed, that most of the design strategies behind dense housing buildings or Big Buildings containing housing focus primarily on disintegrating the massiveness of the volume in order to create perforations, light and 'opportunity spaces' for patios or terraces – to a certain extent, seeking to reproduce the intricacy and the irregularity of the traditional city fabric: "*Cette expérience de l'ordre du sensible provient de la perception visuelle de la masse bâtie, qui apparaît, en faisant abstraction, comme découpée et creusée. (...) La fascination pour l'esthétique des rues et ruelles de la ville médiévale, l'intérêt pour le sentiment de densité qui s'en dégage (...). « certains architectes démontrent que ces inconvénients peuvent être compensés par des solutions de plans et de coupes […] le thème du logement peut et doit être revisité en dehors des conventions, il doit être retravaillé, d'une certaine façon réinventé. Avec un jeu d'ouverture et d'isolement privatif, les architectes thématisent l'art de ‹ coexister sans se gêner ›.*»[1]

In this sense, amidst the extensive range of themes that could explored around the subject of density, we have identified some design strategies that have actually been applied to the design of the buildings we have analysed in order to break the massiveness of the build object, and hence providing the required conditions – in terms of light, privacy and views – allowing for an effective conception of housing. The design strategies we refer to are indeed aimed at creating opportunities to allow quality areas within housing (be it interior elements or exterior ones, like patios, terraces and gardens).

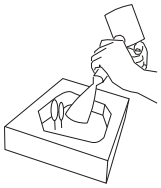
In order to explain the complex design strategies we are referring to, we have decided to group them into three different categories – being that all of them seek to deal with the issue of density and accumulation.



Strategy I – 'Stacking' – subdividing the mass into multiple small (or smaller) volumes and stacking them (like lego pieces), leaving gaps for air and lighting, views, terraces, sometimes even gardens (ex: the Interlace, Habitat 67, Renaudie's Jeanne Hachette Complex, The Mountain by BIG, etc.)



Strategy II - 'Slicing' – cutting of the volume to create thinner elements like towers, more suitable to housing schemes (ex. De Rotterdam and the gaps left in between the towers; see also Steven Holl's Sliced Porosity or the Linked Hybrid).



Strategy III - 'Subtracting' – carving the volume in the middle in order to create internal patios – a strategy that is applied mainly to horizontal schemes (Entrepôt Macdonald, BIG's projects 8Tallet and West 57) – the total depth of the building is far too vast considering the scale of the building, forcing a subtraction to allow the penetration of light on the different programs.

1 Bruno Marchand, « Coexister sans se gêner : densité et modes de vie domestiques dans les centres historiques », *Les Cahiers de L'Aspan*, n°2, 2014, pp. 4-9.

4.3. Mix and public spaces

4.3.1. The importance of planning functional mix within the Big Building

The functional diversity must be one of the base conditions of any Big Building, and also the feature that sets the base for the complex and thrilling environment where housing will be incorporated, ideally bearing witness to a living scheme of intensified innovation and thrill. Just like the city, the Big Building must indeed be a container for a large multiplicity of uses, users and social events.

As seen earlier, the urban fabric has always been the fundamental stage for Mix and Diversity. The confluence of amenities, work and leisure force people to share the space, interact and live in community while accepting differences. We have seen, in the theoretical chapters, that important authors - namely Jane Jacobs, Lewis Mumford, Christopher Alexander or more recently Jacques Lucan - have defended the benefits of diversity and urban concentration for the quality of the urban environments. Indeed, the conviction that a balanced mix of uses within a city represents an effective solution to ensure a thrilling urban life has shaped most of the urban operations realized in the latest decades – envisioning a simultaneous social and functional mix.

Similar issues, related to the mono-functionality or functional segregation have also been addressed to the architectural buildings, mainly after the disastrous outcomes of the large-scale collective housing buildings built during the post-war period (see theoretical part and the reference to the modernism and the *grands ensembles*). Indeed, today's urban doctrines incite not only the multiplicity of uses within city zones, but also the functional mix within the architectural buildings themselves[2].

Throughout our analysis, we have verified that, within the *Big Building*, the concepts of *Density and Diversity/Mix* remain steadily interconnected. It is indeed the Big Building's particular condition of compaction and *high density* that forces space to accommodate different functions with hyper-efficiency, to the point of mixing and overlapping a wide range of programs. The Big Building is generally implemented in a context of *urban density* itself, bearing the potential to become a new *cluster* and a catalyst for a particular city area, which is partly the reason why most of the Big Buildings are designed to bear day-and-night activity and a constant flux of public. In some cases, people are offered the possibility to live, work and spend part of their spare time inside the same building - which ultimately turns the building into a container for a small city; *a city within a city*, active all day long.

2 The potential of the superposition of functions has been highlighted by Rem Koolhaas in *Delirious New York*, who announces the concept of vertical stratification as a promising urban strategy – a potential solution for the densification of the cities (see chapter I).

The confrontation and the proximity of different functions triggers continuous activity within one place and increases exchanges and proximity between users of multiple kinds, which ultimately results on a certain form of *urbanity* that goes beyond the mere concept of collective living. Without functional diversity, the Big Building wouldn't bear the above described inner qualities nor a catalyst effect within a city.

Coming back to our three fundamental case studies, we have observed that, although De Rotterdam and mainly the Entrepôt Macdonald host a significant diversity of programs, we have highlighted the regretful fact that the Interlace contains such a poor functional mix[3] (only housing, a few shops, parking and varied exterior amenities) – neglecting the fundamental principles defended by its author Rem Koolhaas, and yet bearing a volumetric configuration that would easily allow for an articulation of different uses and for the generation of a thrilling mixed ensemble. We could of course blame the developer for this lack of urban programmatic intensity and once again lament the lack of decisional power that an architect may have within the process of conceiving a Big Building. However, it is also reasonable to say that among today's architectural practices OMA would be the one with more influence to push for the implementation a principle that is the practice's calling card: the conception of a robust metropolitan experience, program diversity, social interaction and neighbourhood publicness. Projects at such scale should indeed focus on the public/urban interaction and stay away from the gated model[4].

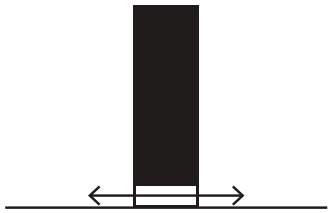
However, we have early noticed that the functional diversity per se does not mean much and that a mere juxtaposition of different functions would just transform the Big Building into a combination of programs without generating any kind of exchanges or intensities[5]. In that sense, in the next lines, we will enhance the importance of the articulation between parts: on the one hand, the articulation between building and city, and secondly on the creation of inner shared spaces - intermediary public/semi-public articulation spaces (like squares in the city) - as structuring elements of a stimulating inner network.

3 In our design experiments, we have indeed highlighted the importance of the functional mix on the definition of the character of the Big Building and, for the Interlace, although we initially said we would stick to the project's existing program, we have felt the need of hypothetically introducing a simple form of mix (the most usual programs, like offices and hotel) in order to understand the potentials and the perceptual effects of such gesture; instead of the existing neighbourhood feeling, we could potentially explore a strengthened city-life feeling, with an intensity that could last throughout the day and merge with the urban life.

4 Erik L'Heureux has raised this criticism in the article "The Interlace", *Australian Design Review*, November 5, 2014. Source: https://www.australiandesignreview.com/architecture/48877-the-interlace (25/09/2016).

5 In our theoretical analysis (chapter II) we have referred to the early mixed use project by Henry Sauvage, Rude des Animaux (Paris, 1922) where despite the existence of low-cost housing and a swimming pool within the same architectural container, no kind of innovation is added by this scheme since there's no visual nor physical connection between the different spaces/uses.

4.3.2. The relation between the Big Building and its urban context – the importance of a thorough ground level planning.



This topic is directly linked to the one of the functional diversity, as it can indeed be observed from the earlier and simplest model of functional mix – the *shop-house* building. An important feature of this model is the fact that it is deeply rooted onto the urban fabric, functioning as an intensive activator of daily life in the city: house, shop and street are three elements in constant interchange of intensities - they are universal to any social or cultural context and, ultimately, the first generators of a wealthy urban system. This model also motivates our thoughtfulness on the importance of the ground floor, the place where the public and the private interact, as fundamental elements to characterize a building and its articulation with the urban fabric.

Contrasting with Rem Koolhaas's statements regarding the intrinsic condition of neglection and disconnection of the Big Building towards its urban context, we have had the chance to analyse multiple large scale examples that undermine this idea, showing, on contrary, that it is possible and desirable to articulate the Big Building with its context, something which can be achieved through a thorough planning of ground floors activities and often through the inclusion of public space/ landscape that is simultaneously accessible to the building's users and to the public.

We have also highlighted the importance of the program type that is placed at the ground level on the rooting of the building with its urban ground. Regardless of how big the building may be, at a human scale, it is always possible to stimulate close interaction between building and city by using softer transition approaches and by cleverly planning the uses at the ground level, ideally accessible both from the inside and the outside of the building. In this matter, the commercial/retail/ restaurant programs have a preferred location at the ground floor, in direct contact with the city[6].

We have seen, among our analysed examples, that the Big Buildings that prove to be more successfully articulated with the urban context and the surrounding streets – the Linked Hybrid, the 8 Tallet, the Entrepôt Macdonald – have in common this intensification of the base, which is occupied with such public/public-related services and activities. And indeed, regardless of how tall, large or strange the building might be on the upper levels, it is possible to stitch them to the ground, following the conviction that the twenty-first century porous urban space must remain inviting and open to the public from every side.

Within the core of our three main case studies, both De Rotterdam and the Entrepôt Macdonald contain commercial activity at the ground level, yet the Interlace is

6 This is a fundamental observation that seems to remain unchanged since the raise of the seminal *house-street* model. We have seen that Le Corbusier's effort to find an alternative model, by placing the commercial street at a higher level inside the *Unité d'Habitation,* did not result as successful as what would have been expected, demonstrating again the close interdependence between commerce and street (we are obviously excluding the shopping mall concept).

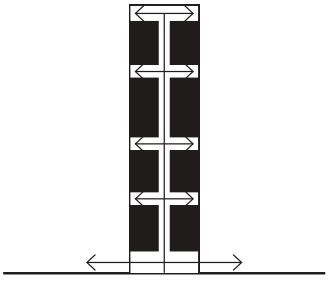
lacking such exploration in terms of program (although its minimal commercial areas are located at the ground floor) which has to do with its intrinsic detachment from the city and with the fact that this small shops are meant to be used by the inhabitants.

Nonetheless, this preoccupation with articulating building and city is better understood in other cases, like at Steven Holl's Linked Hybrid, where the ground bears and intense landscape treatment, a courtyard that is circumscribed by multiple retail activities at the ground level (cafés, bars, restaurants), allowing the building to actively function in articulation with the city. Another interesting example of humanized articulation with the city is BIG's 8 Tallet. The building includes 2 landscaped courtyards on the inner side of its perimeter and 2 concrete squares adjacent to the buildings central intersection where the cafés and retail are located – a place with central community spaces and passageways. It is therefore possible to cross the building and enjoy its services, whereas the inner courtyards remain more private. On the southeast edge, the building touches the ground with a 'street' that runs through the entire building in different levels, providing a sloped access to the ensemble of the row houses with gardens – the idea that one could bike from the public space through the entire building space in different levels is indeed a great metaphor to this idea of linkage between building and ground.

To conclude, the idea that the Big Building remains detached from the city because of its exceptional, monumental scale can be (and shall be) reworked by means of clever design strategies that allow for the re-integration of urban elements and programs that succeed at connecting the building with the city fabric (generally, retail, restaurants and cafés being the more effective).

Ultimately, this idea of bound and merge between building and city can be further intensified when, on the inside, the building includes also a strong network of 'streets' and 'squares' that could almost be seen as a continuation of the city fabric within a sheltered environment. We will explore this idea in the next topic.

4.3.3. Mix and Intermediary spaces: planed within the volume and on rooftops



We have already mentioned that the functioning of any urban fabric is very much based on the concepts of *circulation* and *articulation*: a system of interconnected streets with different hierarchical importance: from the *street of the slum* to the *freeway road*, with public spaces like *parks* or *squares* in between. The architectural building is equally related to the idea of *circulation* and *articulation*, yet the elements it uses to connect spaces are quite different: *corridors, staircases, elevators* and some common areas in between these elements of articulation, that are *halls, lobbies, terraces*. This idea of the Big Building being a hybrid model between architecture and urbanism is particularly understandable when it comes to circulation and articulation, as it requires the introduction of elements that are not the traditional architecture/urban elements but rather something in between: the corridors have more generous widths and may be called 'corridor-streets' or 'streets-in-the-air' when these corridors are exterior galleries, the open terraces can be called 'sky-

plaza', amidst other.
In the multiple examples of Big Buildings that we have listed and analysed, we have seen that one of the most recurrent initial aims of these schemes is the one that pursues the introduction of public space – real public space of the city, accessible to anyone – within the architectural scheme, normally in height, in order to reinforce the statement that the building is not only rooted on the city, but may also become a point of accumulation of the city[7], an extension of the city, adding new thought-provoking areas to the city (not only at the base of the building, as we have seen in the previous lines, but being strategically planed within the inner network and volumetric intricacy of the Big Building's volume) - reinforcing the idea of an urban fabric that suddenly bends and starts growing vertically (or accumulates horizontally).

The thrill of such design intention is undeniable, yet it often doesn't outlast the entire process due to the challenges it implies in terms of security (frequently requiring control measures at the ground level), in terms of space efficiency (not only related to the actual cost of that space, but also the often required addition of a public circulation core, which reduces the floor area efficiency through all the levels) and, finally, in terms of maintenance and its associated costs[8].

We have seen that such feature is usual in the American buildings, whose public zones are normally placed at the rooftop, benefiting from the thrill of the views that motivates the users and the public to go up to the top levels. Joseph Fenton's catalogue of American Hybrids illustrates indeed how often public floors/ restaurants/belvederes are planed at the rooftop levels, with one of the earlier examples being the Schiller building in Chicago (Adler and Sullivan, 1892) and the reference project 100 story building (Theodore Starrett, 1906) indicating an 'amusement park' in its top level.

Following this line, the John Hancock Centre (SOM, 1968) not only contains an intensified range of public services at its upper floors – observatory, restaurant, television studios – but it also introduces an interesting new concept, which is the one of distributing the shared spaces of the building along different floors with different heights (office lobbies, sky lobby), and metaphorically, one starts envisioning the possibility of a form of urbanism that is developed in height – with the vertical core being the 'avenue' that connects the multiple different functional zones, 'neighbourhoods' and 'squares' as one moves up inside the building[9]. We know that this idea of circulation and connection is always limited when it is done

7 Nicola Marzot, "'The net-city': Clusterization and the urban block," Leen Van Duin (ed.), *The urban project : architectural intervention in urban areas*, IOS Press, Amsterdam, 2009 (pp. 214-222).

8 The introduction of a public space in height, directly linked to the ground via an escalator seems to have survived the process and to actually be concretized at the Elbphilharmonie; the space looks thrilling due to its tectonic treatment, its location in height, the views, its articulation with the concert hall foyers and café, yet it is still too early to judge its actual functioning and outcomes. What is very likely is that the public access will have to go through some control at the ground level.

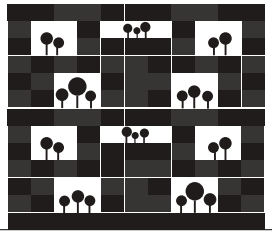
9 Yet we have nonetheless observed that the inclusion of public space, aside with the functional mix within some of these buildings, has led to some issues linked to the lowering of efficiency of the building in terms of floor area ratio.

via elevator – Rem Koolhaas highlights, in *Delirious New York*, the phenomenon of schism that derives from the use of the elevator (see chapter I) – yet Koolhaas doesn't exclude the possibility for uses to share intensities even in a vertical scheme, an idea that is illustrated through the project Downtown Athletic Club. The fascination that Rem Koolhaas seems to nurture over the American model is somehow denounced in his project Dubai Renaissance (2006 – unbuilt), whose presentation images bear the building section superposed with a city network scheme, alongside a city map with streets, squares and different city zones.

It is therefore curious that the one vertical example amidst our three central case-studies – de Rotterdam – does not explore the introduction of public spaces in its upper levels (only on the top floors of the base podium) despite being declaredly inspired on the American hybrids, nor this idea of urban network within a vertical scheme that seems to fascinate Rem Koolhaas. In our design strategies for this building and in general for vertical models, we have tried indeed to play with the intercalation of multiple public/semi-public spaces throughout the building as way of reproducing a model of vertical urbanity. We have used as reference a project of a vertical Big Building, which is Jean Nouvel's Tour du Signal (2008) where these intermediary shared spaces are planned as multiple level voids (courtyards) that subtract to the building's mass and allow for visual perception among the different users. Another aspect that we tried to explore within our design strategies was the horizontality of the building, learning from Le Corbusier's Unité d'Habitation, often called horizontal skyscraper (bearing multiple corridor streets, shops and the rooftop terrace in intercalated levels).

To sum up, a successful model of Big Building might be one where the interior space is planed within the logics of an urban network, with multiple public/semi-public spaces structuring the circulation network. Ultimately, this inner network reinforces the sense of articulation between the building and the city that has been mentioned in the previous point.

4.4. Housing, Typological diversity and Intermediary spaces



We have seen that, in current times, our society is increasingly heterogeneous and changeable, and that the idealism that has guided the work of a former generation of architects/urban planners – namely Le Corbusier (with his principle of the 'ideal man' and the 'typical family type') – has been replaced with new demands for individualism, heterogeneity and differentiation – and with a renewed interest from the architects to experiment with this complexity linked to the idea of conciliating the maximum typological diversity within a single building, aiming to host a wide range of individuals and family types, and suiting the speedily changing living modes.

As seen before, at the *Unité d'Habitation*, Le Corbusier didn't only plan multiple dwelling typologies within the building, but he also cared for the in-between spaces, coming up with the concept of the *corridor-street* and the multiple multiples features planed at the rooftop - potential spaces of encounter for the inhabitants. We have also seen that the particular features of the *Unité d'Habitation* have inspired many other schemes throughout the decades that followed, one of the most obvious being MVRDV's Silodam. In this building, each neighbourhood gets its own collective access principle according to the particular requirements: a hall, a tall corridor, a large balcony, an alley, a garden, a patio – these generate specific housing types, structure and façade. By stacking them independently next to and on top of each other, a system of public routes through the building emerges. When mixed with workspaces and open zones, a vertical neighbourhood arises, "*one that tries to give the apartments equivalents of the house-with-a-garden feeling*"[10]. Although one of the initial aims for the Silodam was the inclusion of public space within the built volume, in the course of the project, it has been discarded for financial reasons. This feature has nonetheless been realized later at the project El Mirador, under the form of an open sky-plaza within a building of seemingly intense typological variety. Although this space was initially open to everyone (the initial plan envisioned a prominent stairway linking the ground to this upper level), its careless use has obliged turning it into a space with restricted access for the inhabitants.

Moreover, we have observed that a large number of today's architectural practices are driven by the belief that spatial proximity and typological diversity may help reducing social differences, and that different dwelling types planed aside may also represent opportunities for different social levels to mix and cohabit harmoniously within the same building/neighbourhood. In the meantime, specific urban regulations have been established to incite social mix (we have seen this through the analysis of the Entrepôt Macdonald and the French regulations that apply to all new urban operations – requiring the integration of 50% social housing). Although we cannot fully testify the effectiveness of this strategy, the truth is that a large number of recent collective housing buildings have been sustained on this principle, often offering an astonishing heterogeneity and variety of dwelling types.

We have seen the effort on finding some evidence for this hypothesis in the social study developed by Monique Eleb and Jean-Louis Violeau at the *Maison Radu*. Although the study is not conclusive in terms of the effectiveness of mixing different housing typologies and social types, one observation seems to become a clear statement: asides with planning dwelling units with quality and typological variety, the design effort must focus on the conception of seducing intermediate spaces in between the dwellings, that may be able to invite people to stay and share the space, while still ensuring the necessary privacy to each home. From the analysis of our selection of social experiments and built examples, we have extracted some thoughts that may serve as guidance for the conception and articulation of dwelling diversity in the Big Building scheme:

10 See full description in MVRDV, *FAR MAX Excursions on Density*, *op. cit.* pp. 534-535.

a) the protection of the intimacy of the dwellings and the inhabitants must ensured within the design of collective housing, being the fundamental premise to allow the concepts of mix and social blending to succeed;

b) **horizontal circulation is likely to trigger more encounters and social events than vertical circulation, and thus it shall be employed in volumes that allow for its exploration**;

c) **diversity must be accompanied of generous and well-planed circulation networks and seducing intermediary zones (public/semi-public/private) in order to trigger and stimulate social interaction** – the corridor-streets must be generous in dimension and carefully planed in terms of materials and/or colour treatment;

d) **the architectural treatment of the dwellings – their configuration, orientation, position, size and intimacy - help somehow differentiating the inhabitants from one another and establishing a certain sense of hierarchy** defined by the quality of the finishes and also by the position each one occupies within the building. Differences must be felt slightly – it is important that the inhabitants understand the differences - but they shall not be too evident in order to stimulate social improvement;

e) **the shared/common spaces within the building shall be carefully designed in terms of size (not too large, not too small), sun exposure and architectural/material treatment; these shall be felt as smooth transitions from interior (private) to exterior (or common) areas;**

f) providing seating areas and exterior furniture elements in intermediary spaces may be a key strategy to generate opportunities for social events and stimulate a sense of appropriation (inhabitants could use these spaces, share them with guests for parties and use them as real prolongations of their home space - yet shared with the neighbours);

g) **the parking spaces become increasingly important as transition spaces between the city and the home door.** It is realistic to think that the most likely path that the users will follow within the building is the one that takes them directly from the parking to their home door or workspace. In that sense, **parking spaces like the ones we have analysed at the Marina city building, the John Hancock centre or even De Rotterdam might be seen as intermediary spaces on their own** (the parking at De Rotterdam can even be perceived from the public escalator that links to the upper semi-public floors on the podium). Although the above mentioned parking spaces have been planned in upper levels due to the impossibility to locate them in underground levels, why not to plan the parking space itself as a pleasant intermediary space with good lighting and/or views?

4.5. Intermediary spaces, housing and the importance of visual perception

Alongside the importance of the effective planning of articulation spaces linking the different uses, we have understood that the visual perception of the whole plays an important role in the character of the Big Building and on the actual feeling and experience of inhabiting a 'self-contained city'. Indeed, if there's a fundamental difference between the domains of architecture and urbanism, it has to do with perception; whereas in an urban context, the observer has a continuous perception of a whole (the sidewalk, the street, the buildings, the crossroads, the squares), within an architectural building, the observer perceives the space on its immediate entourage, loosing the understanding of what happens in other floors.

Although the question isn't raised in horizontal buildings, like the Barbican or the 8Tallet, we have identified this limitation through the study of the American hybrids: at the John Hanckock Centre, for instance, despite the variety of shared spaces/lobbies located in different heights, there is no point within the building where one can perceive this wealth in intermediate levels and functional variety. Regarding this issue, we have found the solution proposed by Jean Nouvel for the unbuilt project *Tour du Signal* quite interesting: the inclusion of multi-level internal courtyards – acting as squares - with gallery-accessed program in one side or both sides of the void. From this courtyard, one would perceive the multiple 'streets-in-the-air' allowing access to the programs and, ultimately, inhabiting this building would become a more complex and thrilling experience - closer to an urban experience of the architectural space.

We have tried to reinforce this idea throughout the ensemble of our analyses, and this has also been a fundamental premise guiding our design strategies. **Possibly as important as establishing an efficient network and linkage between the different programs and the different housing areas, the idea of enabling a visual perception of the ensemble may trigger the understanding and the thrill of living in such an exceptional context of density and mix.**

4.6. Housing and Functional Synergies

The concept of *functional synergy* can be better understood if we go back to Rem Koolhaas's *Delirious New York,* and particularly to the building Downtown Athletic Club. Following the acknowledgement of the unavoidable schism generated by the vertical stacking of functions and the circulation through elevators, Rem Koolhaas finally refers to some interesting phenomena occurring within the this building: as the users of the club (at the bottom) and the users of the hotel (on top) start meeting at the intermediary level (the bar/restaurant), a sort of urban phenomena occurs and the programs within the building start sharing intensities through the users: a circumstance that is metaphorically represented through the image of the boxers who eat oysters with boxing gloves.

If this sort of event can occur in vertical buildings, it is even more likely to happen in horizontal schemes. In that sense, **a potential further step to be considered on the design of Big Buildings would be to start treating functional mix and functional hybridity at a smaller scale: the scale of the street.**

The building 8 Tallet allows us to explain our thoughts: besides its existing functional mix of offices/retail (at the lower levels) and housing (at the upper levels), it would be fair to imagine punctual moments of functional hybridity along the central distribution 'street': a) the planning of raw-houses could include small shops or workshop areas at the lower level, responding to the house-shop concept; b) many other flexible gathering spaces could be planed 'in between' the raw houses, such as workshop areas, co-working spaces, meeting rooms, polyvalent rooms that could be rented for parties or events, and an endless number of functional possibilities.

Due to limitations related to graphic representation, we did not emphasize the demonstration of these possible intricacies and synergies in our design experiments; yet, **we do believe that these could validate a humanistic approach to the complex design of the Big Building, and bear an effective strategy to articulate the radically different scales of the built scheme.**

4.7. Flexibility

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The subject of *flexibility* can be understood through Rem Koolhaas's discourse, who often claims that the sense of uniformity of his buildings is aimed at tolerating some sort of wild proliferation of events on the inside. This flexibility is said to enable future adaptations in uses and inner dynamics, and thus to ensure the building's durability through times, adjusting to the needs of a rapidly changing economy and society and avoiding obsolescence. Although there's no reference to this fact in Koolhaas's writings, it is interesting to state that one of the core case studies scrutinized in *Delirious New York*, the Downtown Athletic Club, is currently in use as a housing building with condominiums - a transformation that occurred after the club's bankruptcy in 2002.

We have learnt from Koolhaas's interviews that the flexibility issue has been a base premise for the conception of De Rotterdam[11]; despite the slight variations in height between the housing and the offices, the inner structure, concentrated mostly on the façade, allows for interior transformation. Partly, the Entrepôt Macdonald bears also witness to this principle of adaptation, for it represents the transformation of an industrial megastructural building from the 1970s, whose structural scheme envisioned already the possibility for future adaptation; paradoxically, the intricacies of the newly built scheme of the Entrepôt Macdonald

11 "*It was always clear that there would be housing, offices and a hotel, and all the facilities, but it was never quite clear in what proportion each element would be. We were thinking that flexibility was important for the project. In the end, what we did was develop a system where each of these elements could be shifted and could be changed and replaced with any of the other elements. So in a way its a diagram that shows, more or less, infinite flexibility in terms of programme*." Source: http://www.dezeen.com/2013/11/27/de-rotterdam-rem-koolhaas-transcript/ (09.09.2016).

seem to neglect this transformative potential. The Interlace - with its structural cores, thick spanning slabs and columns concentrated mostly on the façade – bears a clear flexibility and potential for a future functional transformation - an aspect that is mentioned in the project description.

It seems fairly evident, indeed, that the flexibility and the opportunity for future transformations may be a fundamental premise to be considered during the conception phase of any Big Building, as it is certain that the social and economical conditions, and ultimately the functional needs, will keep fluctuating through times.

Ending notes

The Big Building is a theme of absolute actuality as it is a model that is currently being crafted in several world metropolises. Yet, the vagueness that surrounds the conception of today's Big Building is undeniable, as the increasing complexity of the operational process gradually weakens the role of the architect, making the design process less intelligible. Moreover, our core case-studies have attained completion very recently and many other Big Buildings are currently under construction or in project, making it difficult to evaluate the real outcomes. In that sense, it is our wish that this research highlights the potential of the Big Building as a container for a desirable form of density and complexity, and also a suitable environment for the inclusion of thrilling and innovative forms of collective living.

We conclude indeed this study with a renewed interest and faith on the potentials of the Big Building as a container for interesting new forms of habitat within the city. We don't see it as a model to be replicated as a base for a future urbanism, but rather as a cluster, a point of accumulation that explores the complexity and the thrill of a condition of intensity and hyper density.

We believe that the ensemble of analyses elaborated within the scope of this research can become bases for the extraction of supporting guidelines, both for scientific research and for the architectural/urban practice. Ideally, these guidelines may be useful to practitioners faced with the challenges of complex projects (government, investors, managers, entrepreneurs, developers, architects, planners, journalists, etc.). We also intend to educate the readers towards the importance of the autonomy of the architect regarding the design decisions (and not only as a coordinator of an extensive number of stakeholders), as a fundamental condition to allow the development of Big Buildings containing innovative and virtuous architectural and social environments.

Openness towards complementary related subjects

Some final notes and considerations are important to be mentioned as a way of highlighting the openness of our research towards related themes that haven't been developed in the corpus of this thesis but whose relevance must be acknowledged.
If we were to open the research to political and socio-economical analyses, it would be important to scrutinize the subject in light of the context of a globalized world and also through the standpoint of economic neoliberalism – seeking to understand in which way the triumph of the free-market capitalism directly affects today's architectural design and production, in particular the one of Big Buildings.
It is equally important to highlight our openness towards other architectural contexts and authors.
Our deliberate choice of three core case studies signed by Rem Koolhaas may mistakenly be taken for partial or biased. This choice is somehow related to the strong theoretical and historical character of this thesis and to our aim of crossing three simultaneous research approaches – historical, theoretical, and practical. The analysis of the built projects of one of the main authors launching theoretical thoughts on the subject of Bigness allowed us to establish direct links between theory and design practice, and also to identify the gaps between the two (often not directly related to the architectural practice itself but to economical and political forces).
Nonetheless, there are other architects whose contribution would be worth exploring more in depth, like the work of Steven Holl in Asia or John Portman's realizations in the US. Although Portman's projects are not focused on housing, they may add important elements to the study of large scale and mixed-use buildings, and mainly to nurture the design of the interior space of the Big Building as a ground-breaking 'urban' environment.
Some Asian projects may also be important to look at. Although dystopian, the Kowloon Walled City in Hong Kong is a pertinent reference to the idea of 'self-contained city' or to the subject of hyper density. Another relevant recent example, also in HK, would be for instance the Hysan Place, designed by Kohn Pedersen Fox.
In the South American context, the dystopian Torre David in Caracas, Venezuela, is a pertinent model to illustrate a particular phenomenon of wild and unpredictable urbanism settled in height within an architectural building.
The ensemble of the above-mentioned examples should nurture a consequent and further intensified exploration of the theme, remaining within a positive and innovative approach, in order to sustain and ideally improve the future study and development of the Big Building.

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